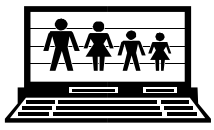
SPSD/M 

Algorithm Guide

This guide is designed primarily to provide SPSD/M users with an understanding of the specific personal tax and cash transfer programs which are simulated, together with specific information on how each program was implemented. The guide is intended for both black box and glass box users.

November 18, 1997


Statistics Canada Statistique Canada

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Introduction

The Algorithm Guide provides SPSD/M users with a description of the specific personal tax and cash transfer programs which are simulated and the specific way in which this is done. An attempt is also made to guide and caution the user, where necessary, as to the interpretation of the results. Also included in this guide are descriptions of processing and utility algorithms which have a significant effect on the results. The guide is intended for both black box and glass box users.

The guide is organized into three main sections. After the first section (this Introduction), there is a section describing the algorithms organized into logical groupings. This is followed by an alphabetically-arranged encyclopaedic section that lists all algorithms in the SPSM.

These modules are referred to as functions. Function names are printed in lower case, bold, courier font (e.g. `txinet, txcalc`). Sub-functions are defined within the function that calls them and are shown in lower case, courier font (e.g. `uiclm, gissub`). Variables are shown as usual in lowercase italics courier font (immicons) and local variables are additionally underlined. These local variables may not be used for reporting purposes unless modifications are made in glass box mode.

These functions tend to have a one-to-one correspondence with actual social and tax programs. In some cases however, two functions are required for one social program (Eg. the child care expense deduction is calculated in one function and allocated to a particular family member in another), or many programs may be simulated in one function (e.g. federal and provincial family allowances are both calculated by one routine.

Subject Reference

1 Algorithm by Program

1.1 Introduction

This guide is designed primarily to provide SPSD/M users with an understanding of the specific personal tax and cash transfer programs which are simulated, together with specific information on how each program was implemented. The guide is intended for both black-box and glass-box users.

1.2 Pre-simulation Functions

The functions in this group are executed prior to the simulation of taxes and transfers. The database is first adjusted to the users specifications, by adj . This adjusted database will form the basis of all base/variant combinations executed in a single program run. Parameter edit checks and the calculation of derived parameters are performed next in mpc. This is done based on .apr parameters and rules embodied in the function. Finally, calls to the tax/transfer algorithms are made for each requested base and/or variant simulation as controlled by the drv function.

1.2.1 Adjust Database

Three functions perform certain adjustments to the database variables prior to the execution of the tax/transfer algorithms. These adjustments can be used to increase the potential applications of the database.

fmspopen	Open .spd binary file and prepare for reading
fmfxopen	Open FAMEX (.fxv) file
adj	Perform SPSD database adjustment

1.2.2 Calculate Derived Parameters

The mpc function calculates derived model parameters and performs edit checks on input tax/transfer algorithm parameters.

mpc	Calculate derived model parameters and do edits

1.2.3 Tax/Transfer Calculator

Two functions are responsible for invoking the algorithms which calculate all taxes and transfers.

call	Call tax/transfer calculator
drv	Tax/transfer calculator

1.3 Government Cash Transfers

1.3.1 Unemployment Insurance Benefits

Unemployment Insurance benefits are calculated by a set of functions which mimic application of UI regulations to individual employment and claim histories. These functions are contained within the ui function

ui	Compute UI benefits

1.3.2 Family Allowances

The fa function calculates federal Family Allowance benefits based upon the number of children in a family and their ages. The function allows for the Alberta and Quebec variations on family allowances as well as the Quebec supplementation of federal family allowances.

fa	Compute family allowance

1.3.3 Federal Child Tax Benefit/Credit

This function is used to calculate either the federal Child Tax Credit program or the federal child tax benefit. Both programs are intended to provide benefits to help low and middle income families meet the costs of raising children under the age of 18.

txctc	Compute child tax credit
cceopt	zero CCE for young kids if optimal

1.3.4 Federal Sales Tax Credits

The refundable federal Sales Tax Credit provides benefits to help low income families offset the costs of federal sales taxes. The txfstc function calculates benefits from the federal Sales Tax Credit (STC) program based upon the number and type of persons in a family and the net income of the head and spouse.

txfstc	Compute federal sales tax credit

1.3.5 Elderly Programs

1.3.5.1 Old Age Security

The Old Age Security program provides taxable monthly benefits to all Canadians age 65 and over who meet the Canadian residency requirements. The SPSM calculates OAS based on the age of the individual and, for immigrants, the years since immigration. The clawback of OAS is performed in the txitax function. This program, together with the GIS program, is subsumed effective in 2001 by the senior's benefit program, implemented in SPSM by the senben algorithm.

oas	Compute OAS for elderly
senben	Compute Seniors Benefit for elderly

1.3.5.2 Guaranteed Income Supplement/Spouses Allowance

The Guaranteed Income Supplementation and Spouse's Allowance programs provide non-taxable monthly benefits to all Canadians age 65 and over who apply and meet the Canadian residency requirements. The program is income tested. This program, together with the OAS program, is subsumed effective in 2001 by the senior's benefit program, implemented in SPSM by the senben algorithm.

gis	Compute GIS/SPA for elderly
senben	Compute Seniors Benefit for elderly

1.3.5.3 Federal Seniors Benefit

The 1996 Federal Budget announced a new Seniors Benefit to replace both the Old Age Security Program and the Guaranteed Income Supplementation program. The Seniors Benefit program provides for non-taxable monthly benefits to all Canadians age 65 and over who meet the Canadian residency requirements. The program is income tested. Because of the guarantee that no persons age 60 or over at the time of the budget can opt to retain the OAS/GIS program, elements of the Federal Seniors Benefit is implemented in four SPSM functions.

senben	Compute Seniors Benefit for elderly
oas	Compute OAS for elderly
gis	Compute GIS/SPA for elderly
cceopt	zero CCE for young kids if optimal

1.3.5.4 Provincial GIS Supplementation Programs

The gist function calculates benefits for seven provincial GIS supplementation programs in six provinces; Nova Scotia, Ontario, Manitoba, Saskatchewan, Alberta, and British Columbia. All modelled provincial senior's programs within SPSM are in this function.

gist	Compute Provincial GIS top-ups for elderly

1.3.6 Social Assistance Benefits

This function is currently used to create a variable for social assistance by manipulating social assistance payments reported by the elderly (idisa) and GIS supplementation programs and other forms of social assistance (imigist). In addition, the splitting of Social Assistance payments between the federal and provincial governments is performed here.

sa	Compute social assistance or guarantees

1.4 Federal Income and Payroll Taxes

1.4.1 Calculate Net Income

The txinet function contains several algorithms which are required to calculate net income. The

algorithms calculate the following specific tax measures.

- Employment Expense Deduction

- Other Allowable Employment Expenses

- Taxable Dividends

- Taxable Capital Gains

- Total Income

- CPP/QPP Contributions (Deduction or Tax Credit)

- UI Contributions (Deduction or Tax Credit)

- Tuition Fees (Deduction or Tax Credit)

- Calculate all deductions from total income

- Assign Taxable portion of Family Allowance to head or spouse

- Calculate Net Income

txinet	Compute net income

1.4.2 Calculate Taxable Income

The process of computing taxable income is divided into two separate routines. Exemptions, deductions and tax credits which are not dependent upon information from other members of the family (e.g., the Basic Personal Exemption or Basic Personal Tax Credit) are collected together in txitax. Algorithms which require information on the age, income or deductions of a spouse or dependant are in txhstr. txitax calculates a provisional value for taxable income (imitax) which may be further adjusted by txhstr.

txitax	Compute taxable income
txhstr	Apply tax transfers between head and spouse

1.4.3 Child Care Expense Allowance

The txccea function calculates the value of the child care expense deduction. The calculation may be optionally converted to a tax credit basis rather than a deduction.

txccea	Compute child care expense allowance

1.4.4 Calculate Federal Tax

This function incorporates algorithms for the following tax measures to complete the calculation of federal taxes payable:

- Federal Dividend Tax Credit

- Basic Federal Tax (including credit transfers)

- Federal Tax Reduction (including transfer to spouse)

- Federal Surtax

- Federal Taxes Payable

- Alternate Minimum Tax

- Quebec Tax Abatement

txcalc	Calculate federal income tax

1.5 Calculate Provincial Taxes

Provincial income taxes are collected by the federal government on behalf of most provinces. Quebec collects its own income tax. Algorithms for computing provincial tax range from taking a proportion of Basic Federal Tax to a parallel of the federal system in Quebec. Most provinces begin with a proportion of federal taxes but have their own systems of tax credits, surtaxes and reductions.

1.5.1 All Provinces except Quebec

txprov	Compute provincial taxes
txnfld	Compute provincial taxes for Newfoundland
txpei	Compute provincial taxes for P.E.I.
txns	Compute provincial taxes for Nova Scotia
txnb	Compute provincial taxes for New Brunswick
txont	Compute provincial taxes for Ontario
txman	Compute provincial taxes for Manitoba
txsask	Compute provincial taxes for Saskatchewan
txalta	Compute provincial taxes for Alberta
txbc	Compute provincial taxes for British Columbia

1.5.2 Quebec

txque	Compute provincial taxes for Quebec
txqinet	Compute net income (Quebec)
txqccea	Compute child care expense allowance (Quebec)
txqitax	Compute taxable income (Quebec)
txqhstr	Apply tax transfers between head and spouse (Quebec)
txqcalc	Calculate federal income tax

1.6 Calculate and Assign Commodity Taxes

Sales & excise taxes are calculated by applying Input/Output based effective sales tax rates to

observed family expenditures at the spending unit level of analysis in the following function..

ctmod	Compute commodity taxes
txhhexp	Compute and pro-rate household taxes, rent, etc.

1.7 Aggregation Routines

Two aggregation functions are used to calculate several reporting variables as aggregates of other modeled variables. The functions calculate all dollar denominated reporting variables up to the level of consummable income. In addition taxable filer status is determined.

memo1	Compute memo items for reporting
memo2	Compute consumable income, etc.

1.8 Glass Box Stub Routines

There are two empty functions in both the staddard and alternate drivers (drv) that are available to allow completely new tax or benefit programs to be developed by glass box users.

dem	Compute new taxable demogrants
gai	Compute new refundable credits or guarantees

1.9 Auxiliary Functions

There are a number of auxiliary functions which are used by the functions containing the tax/transfer algorithms. These functions perform routine tasks required in simulating the tax/transfer system such as table look-ups and benefit reduction functions. The description of these functions is of use to anyone attempting to fully understand or modify the C-language source code for the tax/transfer algorithms.

classu	Compute user-defined reporting variables
isneg	Is argument negative ?
isnneg	Is argument non-negative ?
isnzero	Is argument non-zero ?
iszero	Is argument zero ?
lkup1	Table look-up with interpolation/extrapolation
lkup2	Table look-up without interpolation
maxn	Find the maximum of two numbers
minn	Find the minimum of two numbers

nneg	Change negative numbers to zero
pmaddent	Define and add a parameter
randrnd	Randomly round a floating point number to an integer
round	Round to nearest integer
strn	Retrieve a string constructed from a number
taxbak1	One level tax-back function
taxbak2	Two level tax-back function
vardef	Define structure member as an SPSM variable

Alphabetic Reference

adj Perform SPSD database adjustment

SUMMARY

The `adj` function performs certain adjustments to the database variables prior to the execution of the tax/transfer algorithms. These adjustments can be used to increase the potential applications of the database. The function may currently be used to adjust the amount of RRSP contributions claimed. A brief description of the database adjustment in general is also included.

SPSM Implementation

The SPSD is based on surveys and administrative data collected for the 1988 calendar year. Adjustment of this data may be required for several reasons. The user may wish to use the incomes to represent the incomes in a more recent year such as 1994. As such the user would supply estimates of growth rates for income by source and expenditures from 1988 to 1994. The user may also wish to make adjustments for simulation purposes in the 1988 year. For example, known under-reporting of alcohol expenditures may be treated by scaling each household's alcohol expenses or a deduction item could be scaled down to zero to represent a restriction of a certain tax measure. Finally, the user may wish to adjust the weights of individuals and households to reflect alternate demographic assumptions.

The scaling of money items is performed in two functions inaccessible to the glass box user. Prior to the calculation of any taxes or transfers each dollar denominated database variable is multiplied by a single corresponding database adjustment parameter. There are two key exceptions to this. Employment income, comprising about 70% of total income is given more rigorous treatment due to its relative importance in the overall tax/transfer system. Employment income may be adjusted by industry specific growth rates. CPP/QPP income may be adjusted by differential rates according to age groups which allows for the phasing in of that program. Users should refer to the *SPSD/M Parameter Guide* in this manual for further details on specific adjustment parameters.

The `adj` function is a means for glass box users to affect the adjustment of the database in ways not currently possible. The user may add their own adjustment routines to augment or even offset current means of adjustment. For example if the user wished to grow employment income by age and sex they would set the existing employment parameter to one and enter a new algorithm in this function. One such specific database adjustment provision is currently available in black box mode and is used in the analysis of RRSP contributions.

This adjustment (which will change the value of the idrrsp variable) is designed to allow the user to simulate the increase in RRSP contribution limits in a rough fashion. It allows the user to increase the RRSP contributions of individuals who are near to the current

contribution limits. The facility is activated by setting the RRSPIFLAG parameter to 1. Two cases are distinguished, those who are not covered by a employer-contributed pension plan, and those who are.

If individuals had RRSP contributions but had no RPP contributions, and their RRSP contributions fell between RRSPSMIN and RRSPSMAX inclusive, their RRSP contributions will be increased by RRSPSINC.

If individuals had RPP contributions, then, for those individuals whose total pension contributions (RRSP plus RPP) fell between RRSPEMIN and RRSPEMAX, their RRSP contributions will be increased by RRSPEINC.

Relation to Other SPSM Routines

The `adj` function is called before `drv` and as such is only executed once for every program run. This means that database adjustments will apply to both the base and variant scenarios. The function is called after the other database adjustment routines.

CROSS REFERENCE

Function **Description**

```
INPUT PARAMETERS:
DNINCFLAG      Disable no income flag for calculation
PROVMAP        Provincial remapping [prov]
RRSPEINC       Increment to rrsp if conditions & rpp>0
RRSPEMAX       Maximum (rpp+rrsp) for increment if rpp>0
RRSPEMIN       Minimum (rpp+rrsp) for increment if rpp>0
RRSPIFLAG      RRSP increment activation flag
RRSPSINC       Increment to rrsp if conditions & rpp=0
RRSPSMAX       Maximum (rrsp) for increment if rpp=0
RRSPSMIN       Minimum (rrsp) for increment if rpp=0

INPUT VARIABLES:
hhnin          Number of individuals in household
idrpp          Registered pension plan contributions (207)

OUTPUT VARIABLES:
hdprov         Province
idninco        No income flag (SPSD variables)
idrrsp         RRSP calculated amount (208)
```

call Call tax/transfer calculator

SUMMARY

Stub fuction for use by glass box users who wish to modify database variables either before and/or after tax/transfer calculation. This function calls the standard driver -- drv.c.

cceopt zero CCE for young kids if optimal

SUMMARY

The cceopt function controls multiple calls to the tax transfer calculator drv

Program Description

There are three instances in which the entire calculation of the tax/transfer system for household is necessary. The cceopt funtion controls such recalculations. Each case is discussed under separate headings below:

Pre-calculation of the child tax benefit.

The calculation of Employment Insurance depends in part upon an individual's Child Tax Benefit entitlement. However, Employment Insurance is calculated prior to the Child Tax Benefit. cceopt is used to calculate a preliminary value for the child tax benefit which can then be used in the calculation of Employment Insurance. The final value for a families child tax benefit may differe from the preliminary estimate used for this calculation of Employment Insurance.

Optimization of the Child Tax Credit/Child Tax Benefit

Beginning in 1988 the rules for calculating the child tax credit/child tax benefit and the child care expense credit were altered to ensure that middle income families could not receive the full benefits from both programs. In practice this is done by reducing maximum child tax credit benefits by 25% of claimed child care expenses. The resulting situation is that below a certain income level it is advantageous not to claim any child care expenses incurred. The cceopt function can locate this level and thus maximize the combined benefits from the child care expense credit and the child tax credit/child tax benefit.

Optimization of the federal Seniors Benefit

The Seniors Benefit program was proposed with the promise that no person aged 60 at the time of the release of the 1996 federal Budget would receive lower benefits under the new seniors benefit that they would be entitled to under the OAS/GIS programs. cceopt determines if a senior is entitled to the OAS/GIS system of benefits and if so

SPSM Implementation

cceopt performs the re-calcualtions and optimizations in a specific sequence. The pre-calcualtion of the federal Child Tax Benefit for purposes of correctly calculating Employment Insurance is perrformed first. Next the optimization of the child care expense deduction and the federal Child Tax Benefit is performed. Lastly, the federal Seniors Benefit is optimized. In a small number of cases where families in a given household are entitled to both the Senior's Benefit and the Child Tax Benefit, the Child Tax Benefit optimization will be 'undone' during the optimization of the Senior's benefit. This may result in a small number of spurious 'losers'. The complexity of mutiple recursive calls to the tax/transfer calculator made it undesirable to try and perform an overall optimization.

The SPSM implementation of each type of optimization are described separately below:

Pre-calculation of the child tax benefit.

The first time drv is called Employment Insurance is calculated with a zero value for the federal Child Tax Benefit. This will result in no EI family supplement benefits being assigned. The first time cceopt is called by drv, it first determines if a family is eligible for both EI and the Child Tax Benefit. If so, that household has its entire tax/transfer entitlements/liabilities re-calculated using the value for the federal child tax benefit calculated in the first pass.

Note that there is a circularity between the two programs in that the federal Child Tax Benefit is based, in part, on Unemployment Insurance benefits to the extent that they are included in the definition of net income which is used to clawback the child benefits.

Optimization of the Child Tax Credit/Child Tax Benefit

The default calculation first performed in txccea makes use of any child care expenses associated with the children in the family. In the cceopt function cases subject to optimization are first identified as families having children aged 0-6 with associated child care expenses.

The complexities of the tax reform situation in Canada make it difficult to know how to optimize many of this type of case. Consequently, once these families have been identified, the entire tax/transfer system is recalculated, setting child care expenses for young children to zero. The value of consumable income for both runs is then compared. If the family benefits from this change, the scenario with no child care expenses is kept. Otherwise, the previous scenario is restored by again re-running the entire tax transfer system.

The algorithm is controlled by the parameter CCEZOPT, which is described in the *SPSM Parameter Guide.*

Optimization of the federal Seniors Benefit

The complexities of the tax reform situation in Canada make it difficult to know how to optimize many of this type of case. Consequently, once these families have been identified,

the entire tax/transfer system is recalculated, setting child care expenses for young children to zero.

CROSS REFERENCE

Function	Description
INPUT PARAMETERS:	
CCEZOPT	CCE young kid optimization rules [1=use, 2=zero, 3=optimize]
SBOPTFLG	Optimize Seniors benefit with OAS/GIS
TARGETYEAR	Year of analysis
UIEIOPT	UI Employment Insurance reform option [1=UI, 2=EI Dec'95]
INPUT VARIABLES:	
cfin	First person in census family [pointer]
cfnpers	Number of persons in census family
cfspoflg	Census family contains married couple
hdageeld	Age of eldest in household
hdnkids	Number of children in household
hhncf	Number of census families in household
hhnin	Number of individuals in household
idage	Age
idcfrh	Relationship to census family head
idinspo	Person's spouse [pointer]
idninco	No income flag (SPSD variables)
imccec	Child care expenses claimed on behalf of child
immicons	Consumable income
ucstat	Claim status flag
OUTPUT VARIABLES:	
imcceni	Consumable income with CCE not zeroed
imccez	Is CCE zeroed?
imccezi	Consumable income with CCE zeroed
imfcben	Total Federal Child Benefits
iminet	Net income
imisa	Social assistance (or replacement program)
imninc	No income flag
imsbni	Consum inc with Seniors Benefit not zeroed
imsbz	Is Seniors Benefit Zeroed?
imsbzi	Consum inc with Seniors benefit zeroed

classu Compute user-defined reporting variables

SUMMARY

The classu function is a stub routine which allows the glass-box user to compute and assign values to new or re-defined variables. Variables first must be defined appropriately in vsdu.c and vsu.h. Since this function is normally called by both the standard and alternate model drivers, assignments made in classu will be effective in both cases.

Users should note that classu should only be used when the user is unable to create the desired classification with the User Defined Variable Facility. Please see the *SPSD/M User's Guide* for more information on this alternative facility.

Note that classu is called at the end of drv so that variables defined in classu are not available for use in other tax/transfer algorithms. See the *SPSD/M Programmer's Guide* for more information.

ctmod Compute commodity taxes for individuals and households

SUMMARY

Sales & excise taxes are calculated by applying Input/Output based effective sales tax rates to observed family expenditures at the spending unit level of analysis. The resulting federal government taxes span 40 consumer expenditure (CE) categories while provincial government taxes have both CE category and provincial dimensions. Commodity taxes are also estimated for other levels of analysis such as economic families and individuals.

Program Description

The federal government has a variety of taxes which are levied on goods used in production and for final demand consumption. Some of the major federal tax types are: custom import duties, alcohol and tobacco excise taxes and excise duties, manufacturers sales tax, gasoline excise tax, air transportation tax, and energy use taxes. The provincial governments also levy taxes but with more of an emphasis on consumer goods. Major taxes include liquor commission mark-ups, gasoline taxes, tobacco taxes, and retail sales taxes.

An important characteristic of this tax system is the cascading effect. Tax cascading occurs when a tax rate is applied to the value of a commodity inclusive of another tax type. For example, when an individual makes a long distance call a federal telecommunications tax of 10% is applied to the price of the call. Provincial governments then levy their retail sales tax rates to the value of the call inclusive of the federal tax.

SPSM Implementation

Input/Output Estimation of Tax Rates

Tax costs associated with domestic production are passed to the domestic consumers is the fundamental I/O modeling assumption. For example, alcohol producers require raw materials such as grains, water, energy source etc. If these inputs are produced themselves in other industries, then their selling price may include a manufacturer's tax component. Through Input/Output (I/O) techniques we are able to associate the implicit tax share of the production process to the correct final demand good.

The macroeconomic I/O system is used to construct effective tax rates by tax type, final demand good, and by province. This enables the calculation of the tax burden implicit in each household's reported final demand expenditures.

The federal tax rates have been grouped into six tax types: custom import duties; excise duties; manufacturer's sales tax; excise taxes; other energy taxes; and federal sales tax. The federal sales tax type that has been included for user simulations is set to zero by default. The array of provincial tax rates has also been reduced to six tax types: profits on liquor commissions; liquor gallonage tax; gasoline tax; amusement tax; tobacco tax; retail sales tax.

The above rates are defined as the ratio of a particular tax to the expenditure net of all commodity taxes for a given good in a given province. Therefore, an additional input parameter rate is applied to the FAMEX observations to net out the commodity taxes implicit in the base year.

For a more complete description of the I/O methodology, calculation procedures, tax type composition, etc. see *SPSD/M Commodity Tax Model User's Guide*.

Notes Regarding Expenditure Adjustments

Prior to the execution of the ctmod function, two modifications of the FAMEX data have been performed by the SPSM.

The first is made necessary because of the way SNA and FAMEX treat the expenditures on motor vehicles as net expenditures. If the trade-in exceeds the value of the purchase, or a household sells a vehicle outright, then the expenditure category will contain a negative value. In this case the SPSM treats the net expenditure as an income item (net sale of durables) and it is incorporated into the income calculation. The expenditure category is then set to zero. This procedure is conducted in the two consumer expenditure categories where net sales can occur: New & used automobiles; Recreation, sporting goods, and camping equipment. This modification is not accessible to the user.

The second data modification involves correcting for under-coverage of some FAMEX expenditure components. For example, sales of alcohol and tobacco are monitored very carefully by government agencies and their data indicate roughly twice as much consumption of these two goods as reported on the FAMEX. Two other FAMEX categories report substantially lower consumption than other information sources would indicate. They are semi-durables and expenditures for restaurants & hotels. The GFFMX parameter in the .APR file enables the adjustment of raw FAMEX values to the levels of other sources. We

provide users with factors to inflate expenditures to known 1984 levels.

Estimation of commodity taxes

The ctmod function initially calls the ctfx sub-function to calculate the taxes based on the expenditure patterns of FAMEX spending units. The ctmod function then computes the taxes for other levels of analysis such as individuals or economic families.

The FAMEX expenditure categories must be stripped of their original tax component before the commodity tax calculation can be performed. This is accomplished in the ctfx sub-function by applying the I/O computed CTTXRM parameter (database adjustment parameter) to the expenditure observations.

The effective commodity tax rates are then multiplied by the net expenditures to produce commodity tax levels for each spending unit. If the CTDFLAG is set to 0 then total federal level taxes by commodity and provincial level taxes by commodity and province are calculated. If CTDFLAG is set to 1 then the six detailed federal taxes and seven provincial taxes are generated. Provincial taxes applied are defined in the following input parameters:

- CTPAMU Provincial amusement tax
- CTPGAS Provincial gasoline tax
- CTPICT Provincial commodity taxes on industry
- CTPLGL Provincial liquor gallonage tax
- CTPPLQ Provincial profits on liquor commissions
- CTPRST Provincial retail sales tax
- CTPTOB Provincial tobacco tax

The model ensures that both options will produce identical results in the aggregate.

Commodity taxes are then allocated to individuals in the FAMEX spending unit via personal income shares in the ctmod function. The income of the household's head is derived by adding three variables from the FAMEX income concept not surveyed elsewhere to his/her SPSD income concept variables. These variables are: savings; other money receipts; and net sales of durables. The shares reflect the income distribution after this modification.

The CTOPT parameter controls which income concept is used in the simulation. If the parameter is set to 1 then the FAMEX income concept is used. This measure of income is not linked to other SPSD variables in any way. Therefore, if the user wishes to examine the implications to commodity tax outflows based upon changes in SPSD income variables (i.e. OAS, GIS, income tax changes) then this option should never be specified. Its use should be restricted to pure FAMEX analyses.

If CTOPT is set to 2 then the SPSD income concept is used. This income measure has been corrected for an income bias inherent in Survey of Consumer Finance (SCF) data using Department of Revenue Green Book tax data. This income adjustment is described in detail in the *SPSD/M Database Creation Guide*. The result is a substantial increase in household income for observations in the extreme upper tail.

The FAMEX data suffers from the same under-coverage as the SCF so the reported spending unit expenditure can be out of synch with the Green Book adjusted income. For example, the largest total expenditure observation is around $150,000 while a large tax adjusted household income exceeds $5,000,000.

Setting the CTOPT parameter to 2 scales the commodity tax calculated conditioned on FAMEX spending unit income by the ratio of the SPSD "shared" income concept to an equivalent FAMEX "shared" income concept. In this way tax outlays bear closer relation to the SPSD income levels. However, this leads to some outlay distortions for the extremely wealthy which are described in the Interpretation Section.

Interpretation

There are some other discrepancies between the system of national accounts (SNA) definition of consumer expenditure and that of FAMEX. Generally, SNA includes the entire personal sector whose components are households, self-employed professionals, and universities. FAMEX tracks only households and, therefore, tax levels by commodity are generally lower. For a detailed description of these differences see the *SPSD/M Commodity Tax Model User's Guide*

In the aggregate, differences between income SPSM income concept (CTOPT=2) and the FAMEX income concept (CTOPT=1) are almost negligible. Using 1984 base case parameters the FAMEX option produced a $20.997 billion tax burden on Canadian families while the scaled option generated $21.048 billion. These compare favorably with the SNA estimate of $22.5 billion. However, the differences for the highest income households in great. The top three households show differences of over $200,000. This implies some caution when interpreting commodity tax values for high income observations.

Relation to Other SPSM Routines

The ctmod function calls the ctfx sub-function in order to calculate spending unit commodity taxes. The ctmod function itself is called by the drv function. The ctmod function makes use of parameters derived in the mpc function. The mpc function also ensures that the ctmod function is not executed if the FAMEX data vector is not being read (i.e. if FXVFLAG=0). The calculation of commodity taxes is highly dependent on the parameters applied to the database expenditure items during the database adjustment phase of the simulator.

CROSS REFERENCE

Function	Description
INPUT PARAMETERS:	
CTFAMSNA	FAMEX->SNA conceptual conversion factor [com]
CTDFLAG	Commodity tax detailed calculation flag
CTFCID	Federal custom import duties [com]
CTFEXD	Federal excise duties [com]

```
CTFEXT          Federal excise taxes [com]
CTFGST          Federal GST [com]
CTFLAG          Commodity tax activation flag
CTFMFG          Federal manufacturer's sales [com]
CTFOEN          Federal other energy taxes [com]
CTFTOT          Federal total retail tax equivalent
CTLPROP         Local property taxes
CTNES           Expenditures NES
CTOPT           Commodity tax calculation method [1=FAMEX,2=SPSM]
CTPAMU          Provincial amusement tax [prov]
CTPGAS          Provincial gasoline tax [prov]
CTPLGL          Provincial liquor gallonage tax [prov]
CTPPLQ          Provincial profits on liquor commissions [prov]
CTPRST          Provincial retail sales tax [com x prov]
CTPTOB          Provincial tobacco tax [prov]
CTPTOT          Provincial total retail tax equivalent
CTSAVE          All positive savings

INPUT VARIABLES:
ctnexp          Household expenditure net of taxes
ctothmon        Household money from other sources
cttxfc          Federal commodity taxes (total)
cttxpc          Provincial commodity taxes (total)
fxfomr          Other money receipts
fxgvpen         Gvt pension plan contributions
fxintpl         Interest on personal loans
fxio            I/O expenditure categories [array]
fxipac          Life ins prems and annuity contributions
fxnes           Not elsewhere stated
fxnsave         Negative savings
fxprtax         Property tax
fxpsave         Positive savings
fxpvpen         Private pension plan contributions
fxrecom         Real estate commissions
fxrfees         Registration and license fees
fxsaldur        Sale of durables
fxseqhv         FAMEX record sequence number
fxtptax         Transfer of Property taxes
hdprov          Province
hhnin           Number of individuals in household
idhhrh          Relationship to head of household
immdisp         Disposable income

OUTPUT VARIABLES:
ctfcid          Federal custom import duties
ctfexd          Federal excise duties
ctfext          Federal excise taxes
ctfgst          Federal GST
ctfmfg          Federal manufacturer's sales tax
ctfoen          Federal other energy taxes
ctishrh         Shared income concept (FAMEX)
ctlprop         Local property taxes on owned dwellings
ctnes           Household expenditure not elsewhere specified
ctnexp          Household expenditure net of taxes
ctnexp_         Household expenditure net of taxes [array]
ctothmon        Household money from other sources
ctpamu          Provincial amusement tax
```

```
ctpgas          Provincial gasoline tax
ctplgl          Provincial liquor gallonage taxes
ctpplq          Provincial profits on liquor commissions
ctprov          Province for COMTAX calculations
ctprst          Provincial retail sales tax
ctptob          Provincial tobacco tax
ctsave          Household savings
ctseqhv         FAMEX record sequence number
cttxfc          Federal commodity taxes (total)
cttxfc_         Federal commodity taxes [array]
cttxpc          Provincial commodity taxes (total)
cttxpc_         Provincial commodity taxes [array]
imishri         Shared income concept (FAMEX & SPSD)
imninc          No income flag
imtxfc          Federal commodity taxes
imtxpc          Provincial commodity taxes
```

dem Compute new taxable demogrants

SUMMARY

This is a stub fuction for use by glass box users who wish to incorporate a new program which interacts with the tax system (i.e. taxable benefits).

CROSS REFERENCE

Function **Description**

```
INPUT VARIABLES:
hhnin           Number of individuals in household

OUTPUT VARIABLES:
imiotg          Other taxable demogrants
```

drv Tax/transfer calculator

SUMMARY

The calculation of taxes and cash transfers for any base or variant run is controlled by a function whose only task is to call all other individual tax/transfer algorithm functions. The

sequence of calls is critical to the simulation due to the informational requirements of the tax/transfer functions. For example net income must be known before gis can be calculated. The following list gives the functions called by `drive` in the order in which they are called.

Function	Description
ui	Compute UI benefits
fa	Compute family allowance
oas	Compute OAS for elderly
dem	Stub routine for new pre-tax system programs
txinet	Compute net income (including payroll taxes)
gis	Compute GIS/SPA for elderly
senben	Compute senior benefit
sa	Compute social assistance or guarantees
txitax	Compute taxable income
txhstr	Apply tax transfers between head and spouse
txcalc	Calculate federal income tax
txprov	Compute provincial taxes and credits
gist	Compute Provincial GIS top-ups for elderly(GAINS-A, SIP, etc)
txctc	Compute child tax credit
txfstc	Compute federal sales tax credit
gai	Stub routine for new post-tax system programs
memo1	Compute memo items for reporting
ctmod	Compute commodity taxes
memo2	Compute consumable income, etc.
cceopt	Zero CCE for young children if optimal
classu	Stub routine to compute user defined reporting variables

The calling order of the component functions of drv reflects the logical precedence between them.

- The first functions, ui, fa and oas, simulate programs whose benefits are determined by factors other than income and as such are called first.
- dem is a stub routine for glass box applications that require calculations to occur before entering the tax system routines.
- txinet calculates net income prior to certain transfers.
- gis calculates transfers to the elderly.
- senben calculates senior benefits.
- sa calculates social assistance or guaranteed income transfers.
- Federal and provincial taxes are calculated next in the next four functions with the tx prefix (txitax, txhstr, txcalc, and txprov).
- gist, txctc, and txfstc calculate income tested transfer programs.
- gai is another stub routine that is intended for use by glass box users who wish to simulate options requiring information on all personal income taxes and cash transfers. For example users may use this function to simulate an income supplementation program.
- The memo1 and memo2 functions create aggregate variables for reporting.
- In the ctmod function, sales & excise taxes are calculated by applying Input/Output based effective sales tax rates to observed family expenditures.
- cceopt optimizes income by maximizing the child care expense credit and the child tax credit.
- classu is a stub routine which allows the glass box user to compute and assign values to new or re-defined variables.

The functions called by drv call other functions and sub-functions in order to complete their calculations. The following page contains a complete list of the names of functions and sub-functions along with a short description in the order in which they are called by drv. Please refer to the specific function in this guide for a more detailed description. Sub-functions can be found listed under the function which calls them. Thus for a complete understanding of the calculation of net income one would have to consult both the txinet and txccea functions.

As mentioned earlier, function names are printed in lower case, bold, courier font (Eg. txinet, txcalc) and correspond to a single C language source code file (Eg. txinet.c, txcalc.c). Sub-functions are defined within the function (file) that calls them and are shown in lower case, courier font (Eg. uisqz, gissub). All multiple calls to the same sub-function have been shown here. All functions directly called by drv begin in the first column below, other function calls are indented.

ui			Compute UI benefits
	uiclm		Simulate a UI claim
		uielent	Test UI eligibility: entrance requirements
		uielrep	Test UI eligibility: repeater rules
		uielrge	Test UI eligibility: regional rules
		uiwkbas	UI weeks of benefits: basic entitlement

		uiwklfe		UI weeks of benefits: labour force extended phase
		uiwkrge		UI weeks of benefits: regional extended benefits
		uisqz		Squeeze UI phases into time window
		uisqz		Squeeze UI phases into time window
	uisqz			Squeeze UI phases into time window
	uiclm			Simulate a UI claim
		uielent		Test UI eligibility: entrance requirements
		uielrep		Test UI eligibility: repeater rules
		uielrge		Test UI eligibility: regional rules
		uiwkbas		UI weeks of benefits: basic entitlement
		uiwklfe		UI weeks of benefits: labour force extended phase
		uiwkrge		UI weeks of benefits: regional extended benefits
		uisqz		Squeeze UI phases into time window
	uisqz			Squeeze UI phases into time window
fa				Compute family allowance
oas				Compute OAS for elderly
dem				Stub routine for new pre-tax system programs
txinet				Compute net income
	txccea			Compute child care expense allowance
gis				Compute GIS/SPA for elderly
	gissub			Compute income used to tax back GIS/SPA
senben				Compute senior benefit
	sbsub			Compute income used to tax back Seniors Benefit
sa				Compute social assistance or guarantees
txitax				Compute taxable income
txhstr				Apply tax transfers between head and spouse
txcalc				Calculate federal income tax
txprov				Compute provincial taxes
	txnfld			Compute Newfoundland provincial taxes
	txpei			Compute PEI provincial taxes
	txns			Compute Nova Scotia provincial taxes
	txnb			Compute New Brunswick provincial taxes
	txque			Compute Quebec provincial taxes
		txqinet		Compute net income (Quebec)
			txqccea	Compute child care expense allowance (Quebec)
		tqxitax		Compute taxable income (Quebec)
		txqhstr		Apply tax transfers between head and spouse (Quebec)

	txqcalc	Calculate Income Tax (Quebec)
txont		Compute Ontario provincial taxes
txman		Compute Manitoba provincial taxes
txsask		Compute Saskatchewan provincial taxes
txalta		Compute Alberta provincial taxes
txbc		Compute BC provincial taxes
gist		Compute Provincial GIS top-ups for elderly
txctc		Compute child tax credit
txfstc		Compute federal sales tax credit
gai		Stub routine for new post-tax system programs
memo1		Compute memo items for reporting
ctmod		Compute commodity taxes
ctfx		Compute commodity taxes for FAMEX spending unit
memo2		Compute consumable income, etc.
cceopt		Zero CCE for young kids if optimal
drv		Conditional execution of the Tax/Transfer Calculator
classu		Compute User Defined Reporting Variables

fa Compute family allowance

SUMMARY

The fa function calculates federal Family Allowance benefits based upon the number of children in a family and their ages. The function allows for the Alberta and Quebec variations on family allowances as well as the Quebec supplementation of federal family allowances.

Program Description

The federal Family Allowances program was designed to provide taxable benefits to help meet the costs of raising children under the age of 18 who are resident in Canada and are maintained by their parent(s) or guardian. At least one parent or guardian must be either a Canadian citizen or a permanent resident, visitor or holder of a Minister's Permit under the Immigration Act and have been legally admitted into Canada. The parent(s) or guardian must make application for benefits and their income must be subject to Canadian income tax. Benefits cease to be payable with regard to self-supporting children (i.e. children who begin to earn a taxable income).

Family allowance benefits are generally paid at a uniform rate across Canada. However, provinces may, within certain limits, vary the amount of Family Allowances that the federal

government pays to their residents according to the age and/or number of children in a family. Alberta and Quebec are the only provinces that vary the rate. Alberta varies payment based on the age of the child while Quebec varies payment based on the number of children in the family and then adds a supplement based on the age of the child.

The province of Quebec maintains a separate but linked program under the Quebec Family Allowances Act which provides for benefits to the parent or guardian of an unmarried child under the age of 18 who is not a ward of the province. The applicant must have resided in Quebec for at least one month or be paying Quebec income tax. In 1984 benefits payable were not subject to Quebec income tax, however benefits paid with respect to children aged 16 and 17 were subject to federal tax. Persons in receipt of federal family allowances automatically receive the provincial benefits without application. This program also has a supplement for handicapped children; however, this is not modeled in the SPSM.

The Quebec family allowances are "integrated" with other parts of the Quebec income tax system (Eg. availability allowances). The Quebec availability allowance is calculated as a tax credit and is modelled in function txqcalc for the years 1984-1987. The Quebec Newborn Allowance was implemented in 1988 and is modeled in fa from that year. Benefits are paid per child and rise from $500.00 for each of the first two children to $3000.00 for each subsequent child.

An option permit the user to randomly increase the rank of first and second child in order to reflect the rank distribution of child observed by the RRQ. The program end in October 1997 and is replaced by a Child tax allocation not modeled yet.

SPSM Implementation

The fa function calculates federal and provincial family allowances based on the age of children and number of children in a family. Residency requirements are deemed to have been met in all cases as is the requirement of non self-sufficiency. The function always allocates family allowances as income of the mother unless one is not present in the nuclear family. This temporary allocation is subsequently assigned to the spouse having the higher net income in txinet and txqinet. The function outputs values for federal(imffa) and provincial(impfa) family allowances as well as the value of taxable family allowances(imtfa) for use in other functions. The function loops through each nuclear family in a household.

The function first calculates federal and provincial family allowances for residents of Quebec. Counts of numbers of children by age group are calculated and used to index into two look-up tables for federal and provincial programs as well as to scale the federal age supplement. The values are then aggregated into two local variables, taxable family allowances and federal family allowances. Taxable family allowances are equal to the sum of federal benefits for each child (as determined by that child's rank in the family) plus the federal supplement for each child aged 12-17 plus the portion of Quebec family allowances paid with respect to children aged 16 and 17.

The calculation of Quebec allowances in fa includes the Quebec availability allowance from 1988 forward. It is paid as a supplement to the Quebec family allowances and is represented

by the variable imqaafa. Quebec allowances also include the calculation of the Quebec Newborn Allowance, represented by the variable imqnbfa. This benefit is calculated on the following schedule for 1988:

Child Number	Birth	Age 1	Age 2	Total
1	500	0		500
2	500	0		500
3+	375/Quarter	375/Quarter		3,000

Interpretation

Results obtained from the SPSM with respect to family allowance benefits differ from Health and Welfare Canada administrative data. Overall the SPSM reports 96.7% of the 1984 calendar year average health and welfare total dollars and 97.3% of children for whom benefits are received.

The SPSM has few children in part due to the non-coverage of Yukon, N.W.T., and native reservations, all of which have younger than average populations and larger than average family sizes (approximately 1.5% of children). A second source of underestimation is the special allowances for foster children and children in welfare agencies. The SPSD does not include these children or their benefits which account for .7% of total family allowances. Further, the SPSM does not take into account payments made outside Canada, although the effect of these on the total is insignificant (less than .1%).

The family allowance program requires parents of 'self-supporting' children to notify Health and Welfare Canada and have the benefits with respect to these children suspended. There are about 52,000 of such children aged 16 and 17 on the SPSD with respect to whom benefits are allocated. It is unknown how many of the parents of these children actually report their situation to Health and Welfare Canada. Lastly, no residency check is imposed on the parents and this will have an insignificant effect. It is assumed that the number of children turning age 18 during the calendar year is balanced by the number of new births. That is, full year family allowance benefits paid with respect to children born during 1984 will be overestimates to the same degree that an underestimate arises for benefits not given to 18 year olds who were 17 during calendar 1984.

Relation to Other SPSM Routines

The fa function is called by drv. The function outputs two variables that are used in txinet for deciding which parent will claim the family allowances for tax purposes: taxable family allowances(nftfa) and number of family allowance children(nfnfach).

CROSS REFERENCE

Function	Description
INPUT PARAMETERS:	
AFAC1	Alberta FA benefit per child aged 0 - 6
AFAC2	Alberta FA benefit per child aged 7 - 11
AFAC3	Alberta FA benefit per child aged 12- 15
AFAC4	Alberta FA benefit per child aged 16- 17
FAFLAG	Family allowance flag
PFACFLAG	Use provincial configuration flag
QAAFA	Quebec availability allowance (supplement) [parity,$]
QAAFAFLAG	Availability Allowance: Supplement to Quebec FA
QFAIFLAG	Quebec inclusion of federal family allowance in income flag
QFATFLAG	Make Provincial FA to 16 & 17 year olds taxable
QFFSL	Federal family allowance: Quebec Configuration[parity,$]
QFPSL	Quebec provincial family allowance [parity,$]
QFS	Federal supplement per child 12-17 in Quebec configuration
QNBFA	Quebec newborn family allowance [parity,age]
QNBFAFLAG	Quebec newborn family allowance flag
QNBRFLAG	Quebec newborn family random increase of child rank
STDFA	Standard federal family allowance per child
INPUT VARIABLES:	
hdprov	Province
hhnnf	Number of nuclear families in household
idage	Age
idrand	Random numbers [array]
idsex	Sex
nfinch	First child in nuclear family [pointer]
nfinspo	Spouse of eldest [pointer]
nfnkids	Number of children in nuclear family
nfspoflg	Nuclear family contains married couple
OUTPUT VARIABLES:	
imffa	Federal portion of family allowances
imnfach	Number of family allowance children claimed
imninc	No income flag
impfa	Provincial family allowance
imqaafa	Quebec Availability Allowance FA Supplement
imqnbfa	Quebec newborn Allowance
imqtfa	Quebec taxable family allowances
imtfa	Taxable family allowances
nfineld	Eldest person in nuclear family [pointer]

SUMMARY

The purpose of this maintenance function is to load the FAMEX variables and to grow them by the corresponding database adjustment parameter.

CROSS REFERENCE

Function	Description

```
INPUT PARAMETERS:
CTCFALC         FAMEX reporting error adjustment: Alcohol [prov]
CTCFGAS         FAMEX reporting error adjustment: Gasoline [prov]
CTCFTOB         FAMEX reporting error adjustment: Tobacco [prov]
CTTXRM          Base year commodity tax removal factor [com x prov]
GFCQP           Adjustment Factor: CPP/QPP contributions
GFFABD          Adjustment Factor: Account balancing difference
GFFMX           Adjustment Factor: consumer expenditure categories
[commodity]
GFFOMR          Adjustment Factor: Other money receipts
GFGVPEN         Adjustment Factor: Government pension plan contributions
GFHMKT          Adjustment Factor: Market value of home
GFHMORT         Adjustment Factor: Mortgage value outstanding
GFINTAX         Adjustment Factor: Income taxes
GFINTPL         Adjustment Factor: Interest on personal loans
GFIPAC          Adjustment Factor: Life insurance premiums and annuity
contributions
GFMORTI         Adjustment Factor: Mortgage interest paid
GFNCAL          Adjustment Factor: Net change in assets and liabilities
GFNES           Adjustment Factor: Not elsewhere stated
GFPRTAX         Adjustment Factor: Property tax
GFPVPEN         Adjustment Factor: Private pension plan contributions
GFRECOM         Adjustment Factor: Real estate commissions
GFRFEES         Adjustment Factor: Registration and license fees
GFRRSPT         Adjustment Factor: Total RRSP contributions (FAMEX)
GFTPTAX         Adjustment Factor: Transfer of property taxes
GFUIC           Adjustment Factor: UI contributions
KEEPNEGEXP      Retain negative expenditures in FAMEX
DBVERSION       Version of the database (x100)
INPFXV          Name of FAMEX vector file (in) [string]
INPSPD          Name of SPSD file (in) [string]

INPUT VARIABLES:
fhbfver         SPSD/M binary format version (x100)
fhdbver         SPSD/M database/year version (x100)
fhfiltyp        File type (extension) [string]
fhnnum          Number of numbers in the file
```

```
frclohhv        Cloning factor for FAMEX exp. vector
frcqp           Cpp - qpp contributions
frfabd          Account balancing difference
frfomr          Other money receipts
frgvpen         Gvt pension plan contributions
frhmkt          Market value of home
frhmort         Mortgage value outstanding
frintax         Income taxes
frintpl         Interest on personal loans
frio            Expenditure on the 40 I/O categories [array]
fripac          Life ins prems and annuity contributions
frmorti         Mortgage interest paid
frncal          Net change in assets and liabilities
frnes           Not elsewhere stated
frprtax         Property tax
frpvpen         Private pension plan contributions
frrecom         Real estate commissions
frrfees         Registration and license fees
frrrspt         Total RRSP contributions (FAMEX)
frtptax         Transfer of Property taxes
fruic           UI contributions
hdprov          Province

OUTPUT VARIABLES:
fhhash          Hashed code of header information
fxclohhv        FAMEX cloning factor
fxcqp           Cpp - qpp contributions
fxfabd          Account balancing difference
fxfomr          Other money receipts
fxgvpen         Gvt pension plan contributions
fxhmkt          Market value of home
fxhmort         Mortgage value outstanding
fxintax         Income taxes
fxintpl         Interest on personal loans
fxio            I/O expenditure categories [array]
fxipac          Life ins prems and annuity contributions
fxmorti         Mortgage interest paid
fxncal          Net change in assets and liabilities
fxnes           Not elsewhere stated
fxnsave         Negative savings
fxprtax         Property tax
fxpsave         Positive savings
fxpvpen         Private pension plan contributions
fxrecom         Real estate commissions
fxrfees         Registration and license fees
fxrrspt         Total RRSP contributions (FAMEX)
fxsaldur        Sale of durables
fxseqhv         FAMEX record sequence number
fxtptax         Transfer of Property taxes
fxuic           UI contributions
hdfrstfx        First household in FAMEX group flag
hdlastfx        Last household in FAMEX group flag
hdwgtfx         Sum of household weight for FAMEX group
```

SUMMARY

The purpose of this maintenance function is to load the SPSD variables and to grow them by the corresponding database adjustment parameter. In addition the method of conversion for converted variables is applied. The logic for differential growth of CPP is also applied in this function. The actual code in this function is proprietary and is not released with the SPSD/M product.

CROSS REFERENCE

Function	Description
INPUT PARAMETERS:	
GFADDDED	Growth Factor: Additional deductions from net income (256)
GFALEXP	Growth Factor: Other allowable employment expenses (229)
GFCAPGEX	Growth Factor: Capital gains exemptions (254)
GFCARRY	Growth Factor: Carrying charges (221)
GFCCET	Growth Factor: Child care expenses associated with child
GFCCETT	Growth Factor: Child care expenses (Limit A, Form T778)
GFCHARIT	Growth Factor: Charitable donations (340)
GFCLOSS	Growth Factor: Allowable other years capital loss (253)
GFCPP65	Growth Factor: CPP for age 65
GFCPP66	Growth Factor: CPP for age 66
GFCPP67	Growth Factor: CPP for age 67
GFCPP68	Growth Factor: CPP for age 68
GFCPP69	Growth Factor: CPP for age 69
GFCPP70	Growth Factor: CPP for age 70
GFCPP71	Growth Factor: CPP for age 71
GFCPP72	Growth Factor: CPP for age 72
GFCPP73	Growth Factor: CPP for age 73
GFCPP74	Growth Factor: CPP for age 74
GFCPP75	Growth Factor: CPP for age 75
GFCPPG75	Growth Factor: CPP for age > 75
GFCPPL65	Growth Factor: CPP for age < 65
GFDALIMO	Growth Factor: Alimony paid (220)
GFDISOTH	Growth Factor: Disability amount for dependants (318)
GFDISSLF	Growth Factor: Disability amount for self (316)
GFDUES	Growth Factor: Union and professional dues (212)
GFEMPLO	Growth Factor: Employee home relocation loan dedn (248)
GFEXPLOR	Growth Factor: Exploration and development expenses (224)
GFFDFATC	Growth Factor: Forward averaging tax credit (478)
GFFDSFT	Growth Factor: Foreign tax credit applied to surtax (511)
GFFORAVG	Growth Factor: Forward averaging amount withdrawal (237)
GFFORINC	Growth Factor: Net foreign income (508)
GFFORTX	Growth Factor: Foreign tax paid (507)

```
GFFSITC        Growth Factor: Additional investment tax credit (518)
GFGIFTS        Growth Factor: Gifts to Canada/provinces/culture (342)
GFHOMSTU       Growth Factor: College residence/resident homeowner
assistance (558)
GFHOSSLF       Growth Factor: Ontario HOSP contributions - self (598)
GFHOSSPO       Growth Factor: Ontario HOSP contributions - spouse (599)
GFICAPG        Growth Factor: Capital gains (actual) (127 * 1.5)
GFIDIV         Growth Factor: Dividend income (actual) (120 / 1.5)
GFIEMP         Growth Factor: Employment income [province,sex]
GFIINT         Growth Factor: Interest income (121)
GFILOSS        Growth Factor: Business investment losses (217)
GFINOGV        Growth Factor: Other government income (non-taxable)
GFINOTH        Growth Factor: Other money income (non-taxable)
GFIOINV        Growth Factor: Other investment income with net rental
GFIPENS        Growth Factor: Pension income (115)
GFIROOM        Growth Factor: Net income from roomers and boarders (126)
GFISA          Growth Factor: Social assistance income
GFISEFM        Growth Factor: Self-employed income - farming
GFISENF        Growth Factor: Self-employed income - non-farming
GFITC          Growth Factor: Federal investment tax credits (412)
GFITOGV        Growth Factor: Other government income (taxable)
GFITOTH        Growth Factor: Other non-government income (taxable)
GFLABTXC       Growth Factor: Labour funds tax credit (414)
GFMEDGRO       Growth Factor: Medical expenses, gross (330)
GFMINCAR       Growth Factor: Minimum tax carryover (504)
GFMOVEXP       Growth Factor: Imputed moving expenses (219)
GFNCLOS        Growth Factor: Allowable other years non-capital loss (252)
GFNORTH        Growth Factor: Northern deductions (255)
GFOTHDED       Growth Factor: Other deductions from total income (232)
GFOTHPE        Growth Factor: Other dependant exemptions (305)
GFPARTLO       Growth Factor: Limited partnership losses (251)
GFPOLCON       Growth Factor: Federal political contributions (409)
GFPROPTX       Growth Factor: Net property taxes paid (556)
GFPRVFTC       Growth Factor: Provincial foreign tax credit (Form T2036)
GFPRVPOL       Growth Factor: Provincial political contributions (565)
GFRENTPD       Growth Factor: Total rental payments (555)
GFRPP          Growth Factor: Registered pension plan contributions (207)
GFRRSP         Growth Factor: RRSP contributions (208)
GFSCFCTC       Growth Factor: Child tax credit
GFSCFFA        Growth Factor: Family allowances
GFSCFFTC       Growth Factor: Federal tax credit
GFSCFOAS       Growth Factor: Old age security
GFSCFUIB       Growth Factor: Unemployment insurance benefits
GFSHELTR       Growth Factor: Manitoba shelter allowance (T1C-Man)
GFSTKDED       Growth Factor: Stock option deduction (249)
GFTUITN        Growth Factor: Tuition fees (320)
GFVENCAP       Growth Factor: Venture capital tax credit (564)
GFXII2         Growth Factor: Part XII.2 tax credit (Trusts) (456)
IMPCQPOPT      Imputation method, CQP [1=none 2=rank]
IMPINTOPT      Imputation method, Interest [1=none 2=imputed]
IMPSAOPT       Imputation method, SA [1=none 2=rank]
IMPUIBOPT      Imputation method, UI [1=none 2=rank]
PURR           Ratio current:base unemployment rate [prov]
UIBASEYRMAX    Maximum insurable earnings for base year
UITARGYRMAX    Maximum insurable earnings for target year
FXVFLAG        Read FAMEX expenditure vector file
INPSPD         Name of SPSD file (in) [string]
```

```
WGTFLAG         Read weight file

INPUT VARIABLES:
fhbfver         SPSD/M binary format version (x100)
fhdbver         SPSD/M database/year version (x100)
fhfiltyp        File type (extension) [string]
fhnhh           Number of households in the file
hrbdrms         Number of bedrooms
hrclohh         Number of SCF clones
hrprov          Province
hrroom          Number of rooms
hrtenur         Tenure
hrurb           Size of urban area
idage           Age
idccqp          Converted CPP/CQP benefit
idcintim        Converted interest income (imputed)
idcsa           Converted social assistance
idsex           Sex
irage           Age
irccqp          Converted CPP/CQP
ircfpub         SCF CF publication flag
ircfrh          Relation to census family head
ircfseq         Census family sub-sequence number
ircintim        Converted interest income (imputed)
ircluflg        Common law union flag
ircsa           Converted social assistance
ircuib          Converted UI benefit
iredlev         Educational level
irefpub         SCF EF publication flag
irefrh          Relation to economic family head
irefseq         Economic family sub-sequence number
irestat         Educational status
irhhrh          Relation to household head
irieflag        Institutionalized elderly flag
irimmi          Years since immigrant arrival
irind           Industry
irinseq         Individual sub-sequence number
irlfst          Labour force status
irlyfp          Full or part-time last year
irlystr         Stretches of unemployment last year
irlyun          Weeks unemployed last year
irlyww          Weeks worked last year
irmarst         Marital status
irnonlf         Main activity for non-lf persons
irocc           Occupation
irrklyun        Raking foundation: weeks worked
irrklyww        Raking foundation: weeks unemployed
irscfflg        SCF high-income preservation flag
irschtp         School type
irsex           Sex
irsynthi        Synthetic high income person
m0val           Money item value
m1val           Money item value
m2val           Money item value
m3val           Money item value
urbtyp          Claim type
ureff           Base year effective weekly benefit
```

```
urern           Base year insurable weekly earnings
urexhas         Exhaustee flag
urgotpa         Received parental benefits
urquitp         Penalty for voluntary quit
urrpeat         Repeat claim flag
urstart         Week claim established
urtpcng         Type change flag
urtrnbr         Training benefit weekly rate
urtrnwk         Weeks of training benefits
uruer           Local unemplyment rate (x10)
urweeks         Claim weeks of benefits
urwkhr          Weekly hours of work
urwwork         Weeks of work prior to claim
ury1
ury2
ury3
ury4
ury5
wrwgt           Household weight (float)
CANCELFLAG      Cancellation request flag
DBVERSION       Version of the database (x100)
WGTTOT          Sum of weights on tax file

OUTPUT VARIABLES:
fhhash          Hashed code of header information
hdbdrms         Number of bedrooms
hdclohh         Number of SCF clones
hdnpers         Number of persons in household
hdprov          Province
hdroom          Number of rooms
hdseqhh         Household sequence number
hdtenur         Tenure
hdurb           Size of urban area
hdwgthh         Household weight
hhnin           Number of individuals in household
idaddded        Additional deductions from net income (256)
idage           Age
idalexp         Other allowable employment expenses (229)
idcapgex        Capital gains exemptions (254)
idcarry         Carrying charges (221)
idccet          Child care expenses associated with child
idccett         Child care expenses (Limit A, Form T778)
idccqp          Converted CPP/CQP benefit
idcfpub         SCF CF publication flag
idcfrh          Relationship to census family head
idcfseq         Census family sub-sequence number
idcharit        Charitable donations (340)
idcintim        Converted interest income (imputed)
idcloss         Allowable other years capital loss (253)
idcluflg        Common-Law union flag
idcsa           Converted social assistance
idcuib          Converted UI benefit
iddalimo        Alimony paid (220)
iddisoth        Disability amount for dependants (318)
iddisslf        Disability amount for self (316)
iddues          Union and professional dues (212)
idedlev         Educational level
```

ideducm	Eligible months of education allowance
idefpub	SCF EF publication flag
idefrh	Relationship to economic family head
idefseq	Economic family sub-sequence number
idemplo	Employee home relocation loan dedn (248)
idestat	Educational status
idexplor	Exploration and development expenses (224)
idext	Extra numbers [array]
idfdfatc	Forward averaging tax credit (478)
idfdsft	Foreign tax credit applied to surtax (511)
idforavg	Forward averaging amount withdrawal (237)
idforinc	Net foreign income (508)
idfortx	Foreign tax paid (507)
idfsitc	Additional investment tax credit (518)
idgifts	Gifts to Canada/provinces/culture (342)
idhhrh	Relationship to head of household
idhomstu	College res/resdnt homeowner assist (558)
idhosslf	Hosp. contributions - self (598)
idhosspo	Hosp. contributions - spouse (599)
idicapg	Capital gains (actual)
idicqp	CPP/QPP income (114)
ididiv	Dividend income (actual)
idieflag	Cloned institutionalized elderly person
idiemp	Wages & salaries
idiint	Interest income (121)
idiloss	Business investment losses (217)
idimmi	Years since immigration
idind	Industry
idinogv	Other government income (non-taxable)
idinoth	Other money income (non-taxable)
idinseq	Individual sub-sequence number
idioinv	Other investment income with net rental
idipens	Pension income (115)
idiroom	Net income from roomers and boarders (126)
idisa	Social assistance income
idisefm	Self-employed income - farming
idisenf	Self-employed income - non-farming
iditc	Federal investment tax credits (412)
iditogv	Other government income (taxable)
iditoth	Other non-government income (taxable)
idlabtxc	Labour funds tax credit (414)
idlfst	Labour force status
idlyfp	Last year full/Part time
idlystr	Last year stretches unemployed
idlyun	Weeks unemployed
idlyww	Weeks worked
idmarst	Marital status
idmedgro	Medical expenses, gross (330)
idmincar	Minimum tax carryover (504)
idmovexp	Imputed moving expenses (219)
idnage	Age
idnclos	Allowable other years non-capital loss (252)
idninco	No income flag (SPSD variables)
idnonlf	Major non-LF activity
idnorth	Northern deductions (255)
idocc	Occupation
idothded	Other deductions from total income (232)

idothpe	Other dependant exemptions (305)
idpartlo	Limited partnership losses (251)
idpolcon	Federal political contributions (409)
idproptx	Net property taxes paid (556)
idprvftc	Provincial foreign tax credit (Form T2036)
idprvpol	Provincial political contributions (565)
idrentpd	Total rental payments (555)
idrklyun	Raking foundation: weeks unemployed
idrklyww	Raking foundation: weeks worked
idrpp	Registered pension plan contributions (207)
idrrsp	RRSP calculated amount (208)
idscfctc	Child tax credit
idscffa	Family allowances
idscfflg	SCF high-income preservation flag
idscfftc	Federal tax credit
idscfoas	Old age security
idscfuib	Unemployment insurance benefits
idschtp	School type
idsex	Sex
idsheltr	Manitoba shelter allowance (T1C-Man)
idstkded	Stock option deduction (249)
idsynthi	Synthetic high income person
idtuitn	Tuition fees (320)
idvencap	Venture capital tax credit (564)
idxii2	Part XII.2 tax credit (Trusts) (456)
ucbtyp	Claim type
uceff	Effective weekly rate
ucern	Insurable weekly earnings
ucexhas	Exhaustee flag
ucgotpa	Received paternity benefits
ucquitp	Penalty for voluntary quit
ucrpeat	Repeat claim flag
ucstart	Week claim established
ucstat	Claim status flag
uctpcng	Type change flag
uctrnbr	Training benefit weekly rate
uctrnwk	Weeks of training benefits
ucuer	Local unemplyment rate (x10)
ucuero	Local unemplyment rate (x10)-original value
ucweeks	Weeks of benefits
ucwkhr	Weekly hours of work
ucwwork	Weeks of work prior to claim
ucy1	Weeks on UI in first year before claim
ucy2	Weeks on UI in second year prior to claim
ucy3	Weeks on UI in third year prior to claim
ucy4	Weeks on UI in fourth year prior to claim
ucy5	Weeks on UI in fifth year prior to claim

gai Compute new refundable credits or guarantees

SUMMARY

This is a stub fuction for use by glass-box users who wish to incorporate a new program which does not affect current programs in the tax system (i.e. a new refundable tax credit). It is called by drv after all taxes have been calculated.

CROSS REFERENCE

Function	Description

```
INPUT VARIABLES:
hhnin          Number of individuals in household

OUTPUT VARIABLES:
imiosa         Other SA or guarantees
```

gis Compute GIS/SPA for elderly

SUMMARY

The Guaranteed Income Supplementation and Spouse's Allowance programs provide non-taxable monthly benefits to all Canadians age 65 and over who apply and meet the Canadian residency requirements. The program is income tested. The SPSM gis function is based on the age of the individual and the years since immigration as reported at the time of the SCF survey in April 1985 as well as family net income and family type. The function can calculate GIS, SPA, Extended SPA, and Widowed SPA benefits. The functions contains one sub-function, gissub, which calculates the income on which GIS/SPA benefits are tested.

The GIS/SPA benefits is zero out if the Seniors Benefit is turned on. When activated, the Seniors Benefit takes precedence over OAS/GIS. Persons age 60 or over in May 1996 may elect to receive OAS/GIS rather than the seniors benefits if their benefits are higher.

Program Description

The Guaranteed Income Supplement is a monthly, non-taxable, income tested benefit paid to residents of Canada who are in receipt of a basic Old Age Security pension. Recipients must re-apply annually. The Guaranteed Income Supplement is not payable outside of Canada for

periods of longer than six months. Income testing is based on net income as defined for income tax purposes with the exception of Old Age Security benefits. In the case of a married couple, including common-law, the combined income of the pensioner and his or her spouse is taken into account. Where the individual or couple have an income above a specified amount, the Guaranteed Income Supplement is reduced at a rate of either $1 for every $2 of income, or $1 for every $4 of income, dependent upon the individuals' marital status and the benefit status of their spouses (if present).

The Guaranteed Income Supplement was established in 1966 to provide monthly benefits to OAS pensioners born on or before December 31, 1910, whose income is below a specified amount. For 1967, the monthly benefit was $40 and set at 40 percent of the OAS pension thereafter. The Guaranteed Income Supplement has been changed on various occasions, the most important of which were as follows: 1970, which extended GIS to all OAS beneficiaries who met the income criterion; 1972, provided for annual indexation of GIS based on the CPI; 1973, changed indexation to quarterly from annual; 1977, provided the payment of GIS to partial OAS recipients; 1984, provided an increase in maximum GIS benefits to recipients of partial OAS pensions in the amount of the difference between full and partial OAS benefits.

The Spouse's Allowance is a monthly benefit designed to recognize the difficult circumstances faced by those couples living on the pension of only one spouse, and by many widowed persons. The Allowance is payable to the 60 to 64 year old spouse of an Old Age Security pensioner as well as to any low-income widow or widower age 60 to 64, providing the potential recipient has been a resident of Canada for at least 10 years after reaching age 18. This benefit is income-tested based upon the combined income of both the beneficiary and his/her spouse and must be re-applied for annually. Benefits are not considered as income for income tax purposes and are not payable outside Canada for periods of more than six months.

The Spouse's Allowance came into effect October 1, 1975 and provided for the payment of benefits to persons aged 60 to 64 inclusive who are married to and living with an OAS pensioner. The amount was set at a sum equal to the monthly OAS pension plus the maximum monthly GIS at the married rate. Significant changes to the Spouse's Allowance were made in 1977 with the provision for partial Spouse's Allowance using the same criterion as for OAS; 1979, the extension of the Spouse's Allowance to include surviving spouses of deceased Old Age Security pensioners; 1985, with the provision for Spouse's Allowance to be paid to all widows/widowers age 60 to 64 regardless of deceased spouse's prior pension status.

The GIS, and SPA programs have been designed with the overall income of elderly Canadians in mind and ensure that no OAS pensioner, full or partial, will receive benefits less than the equivalent of a full OAS pension. Because the programs are interrelated, a better understanding is facilitated by discussing them together across the five different family types listed below and discussed in turn. These categories define the basic structure of the SPSM implementation of these programs. In these descriptions pensioner is understood to mean a recipient of either full or partial OAS benefits.

GIS/SPA Type	Family Status
1. Single Pensioner:	Unattached Individual, OAS Pensioner

2. Widowed Pensioner:	Unattached Individual, Age 60-64, Widowed
3. Married 2 Pensioner:	Married Couple, Both OAS pensioners
4. Married pensioner with SPA spouse:	Married Couple, OAS Pensioner with SPA recipient
5. Married pensioner with non-pensioner spouse:	Married couple, 1 OAS pensioner, spouse ineligible for OAS or SPA

Single Pensioner

If an individual is receiving a full Old Age Security Pension he or she may be eligible for the federal Guaranteed Income Supplement (GIS). GIS is an income tested benefit payable to OAS beneficiaries with little or no income beyond to the basic OAS benefit. In the case where a beneficiary of a full OAS pension has no additional income or income of up to a maximum of $24 per year, his/her GIS benefit will be the maximum. For every two dollars of income in excess of $24 annually, the GIS benefit is reduced by one dollar until the benefit is reduced to zero.

In the case where the beneficiary is eligible for only partial OAS benefits, but has little or no other income (again, to a maximum of $24 per year), supplementary GIS is available. Supplementary GIS makes up the difference between the partial OAS benefit that the beneficiary is receiving and full OAS benefits. Thus, a beneficiary with 20 years of residence in Canada would receive 30/40 of a full OAS pension and supplementary GIS benefits up to an amount equivalent to 10/40 of a full OAS pension. This ensures that no OAS pensioner, full or partial, will receive benefits less than the equivalent of a full OAS pension. In addition to the partial OAS pension and the supplementary GIS benefits, an individual may also receive the regular GIS benefit. Both the regular and the supplementary GIS benefits are income tested and reduced at a rate of one dollar for every two dollars of income in excess of $24 per year.

Widowed pensioner

The Spouse's Allowance is an income-tested benefit payable to individuals who are between 60 and 65 years of age and are spouses of Old Age Security beneficiaries. In order to qualify for this benefit, the applicant must meet the same residence requirements set out for the basic Old Age Security Pension. The guarantee for the benefit is equivalent to the sum of the full basic Old Age Security Pension plus the Guaranteed Income Supplement at the married rate. This benefit is reduced by $3 for every $4 of the beneficiary's monthly income or the couple's combined monthly income until the OAS-equivalent is reduced to zero. At that point the GIS portion reduces at the rate of $1 for every $4 of combined income until benefits are reduced to zero.

If an individual receiving Spouse's Allowance becomes a widow or widower, they are then eligible for an Extended Spouse's Allowance until they reach the age of 65 at which time they will become eligible for a basic Old Age Security Pension and the Guaranteed Income Supplement. The amount of the Extended Spouse's Allowance is somewhat higher than the regular Spouse's Allowance to account for the fact that the beneficiary is now in a single income family.

In addition to the regular and Extended Spouse's Allowances, benefits exist for widows and widowers between 60 and 65 years of age whose spouse died prior to becoming a pensioner. The Widowed Spouse's Allowance pays benefits at the same rate as the Extended Spouse's Allowance. Both the Extended and Widowed Spouse's Allowances are reduced by $3 for every $4 of monthly income until the OAS-equivalent portion is reduced to zero and then by $1 for every additional $2 of monthly income until the GIS-equivalent portion is reduced to

zero.

The Spouse's Allowance is not considered as income for income tax purposes but may, however, affect taxes indirectly via the spousal exemption amount.

Married Couple, Both Pensioners

GIS eligibility for couples is first based upon receipt of OAS. If the applicant is not eligible for OAS, then he or she is not eligible for GIS. Once eligibility for GIS has been established, then the rate of recovery or rate at which GIS is reduced because of additional income, must be established. For two pensioner couples, where both are OAS beneficiaries, GIS is reduced by one dollar for every four dollars of the couple's combined monthly income in excess of $48 per year. In 1984, the maximum regular GIS payable to a married beneficiary was less than that payable to a single beneficiary. As in the case of a single beneficiary receiving only partial OAS benefits, a supplementary GIS benefit is available which makes up the difference between partial and full OAS benefits.

Married Pensioner with SPA Spouse

GIS is payable to the pensioner at the same rate as is paid to an individual in married couple where both spouses are pensioners. The amount of SPA benefit is equivalent to the combination of the full basic Old Age Security Pension and Guaranteed Income Supplement at the married rate. This benefit is reduced by $3 for every $4 of combined monthly income (75%) until the OAS-equivalent is reduced to zero. At that point both the remaining portion of the Spouse's Allowance, and the pensioner's Guaranteed Income Supplement are each reduced by $1 for every additional $4 (50%) of the couple's combined monthly income.

The benefits payable to a pensioner with a given income could vary depending on whether the couple had applied for SPA; the benefit being higher for single pensioner couples. To ensure benefits are equal in these cases the SPA couple's benefits begin to be reduced at the effective rate of 25%, $1 for each $4 of family income after the crossover point. This is done by holding the pensioner's benefits fixed from the crossover point until the SPA benefits are reduced to zero; then the pensioners benefits continue to be reduced at the same married rate (see following figure).

GIS and SPA For Married Couples, 1 is not an OAS Pensioner

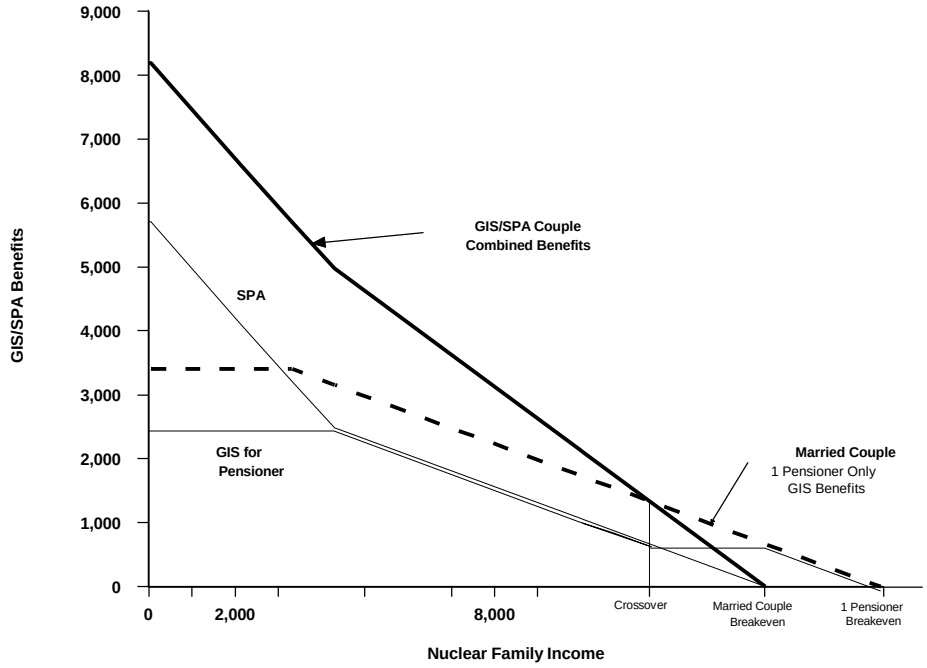

Figure 2 GIS/SPA Benefits for Married Pensioner with Non-Pensioner Spouse

Married Pensioner with Non-Pensioner Spouse

In the case of a pensioner whose spouse is under 60 years of age or is a recent immigrant, and therefore not eligible for OAS, GIS or SPA, the pensioner receives GIS at the higher single rate and benefits are reduced $1 for every $4 of the couple's combined monthly income with the first reduction being made only when their combined monthly income exceeds an amount equivalent to basic OAS plus $4 per month. (see figure above)

SPSM Implementation

The gis function determines benefits based on the age of the individual, the years since immigration as reported at the time of the SCF survey in April 1985, combined family income, and family type. The function makes use of the immoasres, imoaspar variables created in the oas function to determine residential eligibility.

The function initially performs some screenings and pointer assignments for efficiency, and then makes a call to the gissub function to determine the previous years income, which will be used when calculating GIS/SPA benefits. This sub-function adds together all the components of total income listed below and multiplies them by a deflator PYINC to estimate the value of the previous year's income.

Net Income = PYINC *	Deflator To Simulate Previous Years Income
imicapgt	Taxable Capital Gains
+ ididiv	Dividends Received
+ idiint	Investment Income

+ idiemp	Employment Income
+ idisenf	Non-Farm Self Employment Income
+ idisefm	Farm Self Employment Income
+ idioinv	Other Investment Income
+ iditoth	Other Income
+ idiroom	Income From Roomers
+ idicqp	CPP/QPP Benefits
+ idipens	Private Pension Income
+ iditogv	Other Taxable Government Transfers
+ imiuib	Unemployment Insurance Benefits
- imalexp	Other allowable Employment Expenses
- imcqppc	CPP/QPP Contributions
- imuic	Unemployment Insurance Contributions

Benefits are then calculated in each of the five groups discussed above. Every individual is assigned a value for the variables imoldtyp and imgistyp which define the type of pensioner couple and are used in the gist function.

The GIS supplement for the OAS shortfall for immigrants is calculated conditional on the setting of GISOASFLAG in all cases except the SPA recipient in a married couple. This should be set to one in years 1984 and later. No adjustment is made to account for the first quarter in 1984 for which no shortfall adjustment was made.

Take-up rates for GIS and SPA benefits are optionally applied depending on the value of the GISTURFLAG parameter. The rates are applied to individuals and to one spouse of a married couple. The algorithm assumes that the take-up rate look-up table margins are all dollar denominated GIS or SPA benefit levels.

Take-up rates for extended SPA may be applied by setting the value of SPAEFLAG to one. The two look-up tables SPAME and SPAFE are used to determine whether a widowed person aged 60 to 64 years would have had a spouse receiving OAS at the time of that spouse's death and consequently be eligible for Extended SPA.

Relation to Other SPSM Routines

GIS and SPA depends on the input parameters for basic GIS/SPA benefits and various variables calculated in the oas function. The function also makes use of parameters derived in the mpc function. The mpc function also ensures that GIS is not calculated without OAS being calculated first. The calculation of OAS and other modeled variables occurs prior to and effects the calculation of GIS and related GIS 'top-up' programs in the gist function. The gis function is called after txprov (calculation of provincial income taxes) by drv and as such has no impact on the personal income tax system.

CROSS REFERENCE

Function	Description
INPUT PARAMETERS:	
BESPA	Basic GIS portion of extended SPA
BGISM	Basic GIS - married
BGISS	Basic GIS - single
BOAS	Basic OAS
ESPAT	Extended SPA take-up rate by benefit level [benefit,rate]
GISBE2	Breakeven for GIS/SPA couple
GISCT	GIS take-up rate: pensioner couple by benefit level [benefit,rate]
GISFLAG	Federal GIS/SPA/ESPA flag
GISOASFLAG	1984 GIS top-up to OAS residence shortfall flag
GISOT	GIS take-up rate: one pensioner couple by benefit level [benefit,rate]
GISRLM	Basic GIS reduction level: married pensioners
GISRLS	Basic GIS reduction level: single pensioners
GISRRM	Basic GIS reduction rate: married pensioners
GISRRS	Basic GIS reduction rate: single pensioners
GISST	GIS take-up rate: single pensioner by benefit level [benefit,rate]
GISTURFLAG	GIS take-up flag: apply 5 take-up tables
PYINC	Deflator to calculate previous year income
SBFLAG	Activate calculation of Seniors Benefit
SBOPTFLG	Optimize Seniors benefit with OAS/GIS
SPAEFLAG	Extended SPA eligibility probabilities flag
SPAFE	SPA take-up rate: eligible female widow [age,probability]
SPAME	SPA take-up rate: eligible male widower [age,probability]
SPAOASRR	OAS portion of SPA taxback rate
SPARL	SPA reduction point: one married/ widowed
SPAT	SPA take-up rate by benefit level [benefit,rate]
SPAXO	Benefit Cross-over GIS/SPA vs GIS one pensioner couple
INPUT VARIABLES:	
hhnnf	Number of nuclear families in household
idage	Age
idicqp	CPP/QPP income (114)
ididiv	Dividend income (actual)
idiemp	Wages & salaries
idiint	Interest income (121)
idioinv	Other investment income with net rental
idipens	Pension income (115)
idiroom	Net income from roomers and boarders (126)
idisefm	Self-employed income - farming
idisenf	Self-employed income - non-farming
iditogv	Other government income (taxable)
iditoth	Other non-government income (taxable)
idmarst	Marital status
idrand	Random numbers [array]
idsex	Sex

```
imalexp         Allowable employment expenses
imcqppc         CPP/QPP contributions
imicapgt        Capital gains (taxable)
imioas          OAS benefits
imiuib          Unemployment Insurance\Employment Insurance benefits
imoaspar        Partial OAS residency flag
imoasres        Partial OAS fraction
imsbz           Is Seniors Benefit Zeroed?
imuic           UIC contributions
nfageeld        Age of eldest in nuclear family
nfineld         Eldest person in nuclear family [pointer]
nfinspo         Spouse of eldest [pointer]
nfspoflg        Nuclear family contains married couple

OUTPUT VARIABLES:
imgisinc        Individual's income for GIS/SPA reduction
imgismax        Maximum amount of GIS
imgistyp        Type of GIS entitlement
imigis          GIS benefits
imispa          Spouse's allowance
imninc          No income flag
imoldtyp        Type of GIS/SPA nuclear family
imspamax        Maximum amount of SPA
imspatyp        Type of SPA entitlement
```

gist Compute Provincial GIS top-ups for elderly

SUMMARY

The gist function calculates benefits for seven provincial GIS supplementation programs in six provinces; Nova Scotia, Ontario, Manitoba, Saskatchewan, Alberta, and British Columbia. The function requires that both OAS and GIS be calculated first. All provincial senior's programs within SPSM are in this function. Please note that the provincial programs here are not exhaustive, but all major benefits are covered.

The calculation procedure were modified to allow the program to be triggered by Federal Senior benefits. The program description in Ontario, Saskatchewan and BC is improved to reflect administrative practices in mixed case (ineligible-eligible).

Program Description

Six provinces provide cash benefits to pensioners in receipt of federal OAS, GIS, and in some cases, SPA benefits. The seven programs differ in terms of the level of benefits payable, eligibility requirements, etc. Each program listed below is modeled and documented independently.

Nova Scotia	Special Social Assistance
Ontario	Guaranteed Annual Income System (GAINS-A)
Ontario	Sales Tax Grant Program

Ontario	Property Tax Grant Program
Manitoba	Supplement for Pensioners (55+)
Saskatchewan	Income Plan (SIP)
Alberta	Assured Income Plan AAIP
Alberta	Widow's Pension
British Columbia	GAIN for Seniors Supplement (Guaranteed Available Income for Need)

Nova Scotia Special Social Assistance

All residents of the province of Nova Scotia who are in receipt of GIS in March of a given year are eligible for Special Social Assistance. Application for benefits must be made each year. SPA recipients are not eligible. One lump-sum payment is made yearly in one of four amounts scaled to the proportional GIS of the recipient as follows:

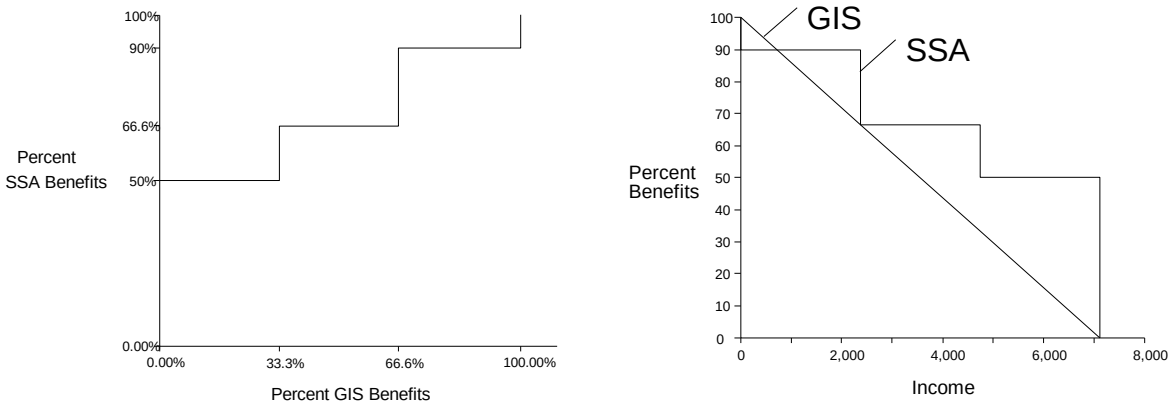

Figure 3. Nova Scotia Special Social Assistance

So, for example, a pensioner receiving maximum GIS benefits would receive maximum SSA benefits and a pensioner receiving 80% of maximum GIS benefits would receive 90% of maximum SSA benefits.

Ontario Guaranteed Annual Income System (GAINS-A)

GAINS-A provides a monthly benefit to Ontario residents in receipt of GIS who meet certain income and residence requirements. A person must have lived in Ontario for the year prior to applying for GAINS-A or for at least 20 years after turning 18 years of age. GIS recipients need not apply since their eligibility is reviewed automatically. SPA recipients are not eligible. There are two levels of benefits, single and married. Benefits are reduced at the same rate as GIS.

Ontario Sales Tax Grant Program

The sales tax grant has been a flat $50 per person over age 65 from 1984 to 1989. The maximum value of the sales tax grant is stored in the ONTSTG parameter. The variable impstg is used to store individual sales tax grants calculated by the model.

Ontario Property Tax Grant Program

The property tax grant is payable to seniors who are head of their household. The amount of the grant varies by tenure and actual costs. For years 1984 to 1989 renters receive 20% of their rental costs up to a maximum of $500. Homeowners receive the maximum benefit. The fraction of rental costs allowed is contained in the ONTFPTG parameter while the maximum benefit is stored in the parameter ONTPTG. Calculated benefits are stored in the variable impptg.

Calculated benefits for both the sales tax grants and the property tax grants are also added to the variable imigist.

Manitoba Supplement for Pensioners (MSP, 55+)

The MSP provides quarterly benefits to Manitoba residents who are in receipt of certain levels of GIS and SPA benefits, including extended and widowed SPA recipients. MSP also provides benefits to persons aged 55 and over who are not in receipt of OAS benefits but whose income falls in a specified range and is derived at least 50% from pension sources. Eligibility is renewed automatically for GIS and SPA recipients, but non-GIS/SPA pensioners 55 years of age and over must apply.

In the case of GIS/SPA recipients there are two levels of benefits, single and married. An SPA recipient is treated as a single pensioner. Benefits are reduced at the same rate as GIS based on family income. Non GIS/SPA pensioners are treated in exactly the same manner except for couples benefits are reduced based on individual annual income.

Saskatchewan Income Plan

SIP provides monthly benefits to Saskatchewan residents in receipt of GIS and whose incomes don't exceed specified levels. SPA recipients are not eligible for SIP benefits. There are two levels of benefits, single and married. There are three different reduction rates. Unattached Individuals and Married Couples where both are GIS pensioners SIP benefits are reduced by $1 for each $1 reduction in GIS. For a pensioner whose spouse is not eligible for OAS/GIS/SPA the benefit is reduced by $3 for each $1 reduction in GIS benefits. The pensioner spouse of an SPA recipient has their benefit reduced by $1 for each $3 reduction in their spouse's SPA. There are monthly minimum benefits at both single and married levels.

Alberta Assured Income Plan

AAIP benefits are payable monthly to all Alberta residents who are in receipt of GIS benefits or who became eligible for the extended SPA prior to May 1983. Regular SPA recipients are ineligible. Since May 1983 all extended SPA recipients are referred to the Alberta Widow's pension. Application is not required. There is one individual benefit which is reduced by 50¢ for each $1 reduction in GIS benefits to a minimum of $10 monthly.

Alberta Widowed Pension

The Alberta Widow's pension provides monthly benefits to widows and widowers aged 55 to

64 years who reside in Alberta. Yearly Application must be made. Maximum benefits are reduced by $1 for each $1 of previous year's non-exempt annual income. Extended SPA recipients may apply however their SPA benefits are included in their income when calculating entitlement.

British Columbia GAIN for Seniors Supplement

GAIN provides a monthly benefit to British Columbia residents in receipt of GIS or SPA who meet certain income and residence requirements. GIS/SPA recipients need not apply since their eligibility is reviewed automatically. There are two levels of benefits, single and married. Benefits are reduced at the same rate as GIS.

SPSM Implementation

The user is invited to read the source code in order to examine the implementation of these programs. A subsequent update will include a written description of the implementation of these programs.

Interpretation

In general the problems of coverage, including take-up, discussed in the interpretation of OAS and GIS are also present here. Specifically there are no tests made for residential eligibility applied on Ontario GAINS-A. Currently double counting occurs for the benefits for Manitoba residents under the age of 65. This is because the calculated income is reported in one variable (imigist) and reported income from the survey is reported in another(imisa). There are plans to fix the problem; however, the dollar amounts are small in any case.

Relation to Other SPSM Routines

Provincial GIS supplement programs depend on various program specific input parameters as well as variables calculated in the oas and gis functions. The mpc function ensures that provincial GIS supplements are not calculated without GIS being calculated first. The calculation of OAS and GIS occurs prior to and effects the calculation GIS 'top-up' programs in the gist function. The gist function is called after gis by drv and as such has no impact on the personal income tax system.

CROSS REFERENCE

Function	Description
INPUT PARAMETERS:	
ALTAMIN	Alberta GIS supplement minimum annual benefit
ALTASC	Alberta GIS supplement maximum annual benefit
ALTASOPT	Alberta seniors option [1=GIST,2=new seniors benefit 1994]
ALTAWP	Alberta widow's pension maximum annual benefit

ASBBASIC	Alberta seniors benefit annual basic benefit
ASBMAR	Alberta seniors benefit married couple income turndown
ASBNSS	Alberta seniors benefit non-senior spouse supplement
ASBRENT	Alberta seniors benefit renter supplement
ASBSS	Alberta seniors benefit senior spouse supplement
ASBTD	Alberta seniors benefit basic income turndown
BCC	British Columbia GIS supplement: married pensioners
BCS	British Columbia GIS supplement: single pensioners
BOAS	Basic OAS
GISRLM	Basic GIS reduction level: married pensioners
GISTFLAG	Provincial GIS top-up flag
MANC	Manitoba GIS supplement: married pensioners
MANCNPF	Manitoba GIS supplement reduction point: married
MANS	Manitoba GIS supplement: single pensioners
MANSNPF	Manitoba GIS supplement reduction point: single
NS13	Nova Scotia GIS supplement for 1/3 GIS
NS23	Nova Scotia GIS supplement for 2/3 GIS
NSLT13	Nova Scotia GIS supplement for less than 1/3 GIS
NSMAX	Nova Scotia maximum GIS supplement level
ONTC	Ontario GIS supplement: married pensioners
ONTFPTG	Ontario property tax grant (fraction of rent)
ONTPTG	Ontario property tax grant for seniors
ONTS	Ontario GIS supplement: single pensioners
ONTSTG	Ontario sales tax grant for seniors
PYINC	Deflator to calculate previous year income
SASKC	Saskatchewan GIS supplement: married pensioners
SASKMINC	Saskatchewan GIS supplement minimum benefits: married
SASKMINS	Saskatchewan GIS supplement minimum benefits: single
SASKRR1	Saskatchewan GIS supplement reduction rate: regular
SASKRR2	Saskatchewan GIS supplement reduction rate: 1 GIS
SASKRR3	Saskatchewan GIS supplement reduction rate: SPA
SASKS	Saskatchewan GIS supplement: single pensioners
TARGETYEAR	Year of analysis

INPUT VARIABLES:

hdageeld	Age of eldest in household
hdprov	Province
hdtenur	Tenure
hhnin	Number of individuals in household
idage	Age
idcfrh	Relationship to census family head
idieflag	Cloned institutionalized elderly person
idinspo	Person's spouse [pointer]
idipens	Pension income (115)
iditogv	Other government income (taxable)
idmarst	Marital status
idspoflg	Person has spouse
imgisinc	Individual's income for GIS/SPA reduction
imgismax	Maximum amount of GIS
imgistyp	Type of GIS entitlement
imigis	GIS benefits
imisbspa	Federal Seniors Benefit SPA
imisenb	Federal Seniors Benefit
imispa	Spouse's allowance
imitot	Total income
imrentpd	Imputed rent paid
imsbmax	Federal Seniors Benefit maximum benefit

```
imsboas         Federal Seniors Benefit OAS portion
imspamax        Maximum amount of SPA
imspatyp        Type of SPA entitlement

OUTPUT VARIABLES:
imiasb          Alberta seniors benefit
imigist         GIS provincial top-up
imninc          No income flag
impptg          Provincial property tax grant for seniors
impstg          Provincial sales tax grant for seniors
```

isneg Is argument negative ?

SUMMARY

```
int isneg(var);

NUMBER var
```

The isneg function (actually a C-language macro) takes as argument a floating point variable name (i.e. something declared as a NUMBER), and returns a non-zero value if the argument contains a negative value. If the argument is zero or positive, a value of zero is returned. Note that, unlike a function, the isneg macro cannot take an expression as an argument. The expression isneg(var) is functionally equivalent to an expression of the form (var < 0) but for reasons that are beyond the scope of this manual, the macro is considerably more efficient than the corresponding expression.

isnneg Is argument non-negative?

SUMMARY

```
int isnneg(var);

NUMBER var;
```

The isnneg function (actually a C-language macro) takes as argument a floating point variable name (i.e. something declared as a NUMBER), and returns a non-zero value if the argument contains a non-negative value. If the argument is negative, a value of zero is returned. Note that, unlike a function, the isnneg macro cannot take an expression as an argument. The expression isnneg(var) is functionally equivalent to an expression of the form (var >= 0) but for reasons that are beyond the scope of this manual, the macro is considerably more efficient than the corresponding expression.

isnzero — Is argument non-zero?

SUMMARY

```
int isnzero(var);

NUMBER var;
```

The isnzero function (actually a C-language macro) takes as argument a floating point variable name (i.e. something declared as a NUMBER), and returns a non-zero value if the argument contains a non-zero value. If the argument is zero, a value of zero is returned. Note that, unlike a function, the isnzero macro cannot take an expression as an argument. The expression isnzero(var) is functionally equivalent to an expression of the form (var != 0) but for reasons that are beyond the scope of this manual, the macro is considerably more efficient than the corresponding expression.

iszero — Is argument zero?

SUMMARY

```
int iszero(var);

NUMBER var;
```

The iszero function (actually a C-language macro) takes as argument a floating point variable name (i.e. something declared as a NUMBER), and returns a non-zero value if the argument contains the value zero. If the argument is non-zero, a value of zero is returned. Note that, unlike a function, the iszero macro cannot take an expression as an argument. The expression iszero(var) is functionally equivalent to an expression of the form (var == 0) but for reasons that are beyond the scope of this manual, the macro is considerably more efficient than the corresponding expression.

lkup1 — Table look-up with interpolation/extrapolation

SUMMARY

```
NUMBER lkup1(tbl, tblnum, input);

NUMBER tbl[][3];
int tblnum;
NUMBER input;
```

The lkup1 function is used to perform table look-ups with interpolation. Expressed another way, lkup1 evaluates continuous piecewise linear functions.

The first argument (tbl) is the address of an SPSM look-up table, which is an n x 3 array of floating point numbers. The first two columns of tbl contain the (X,Y) pairs that define the piece-wise linear function. The third column of tbl contains the slope of the segment that starts at the (X,Y) pair. SPSM look-up tables are defined in parameter input files, and come in two varieties, as perceived by the user. One variety allows the user to specify the (X,Y) pairs, and computes the slopes automatically. The other variety allows the user to specify all the X values, the first Y value, and the slopes, and computes the remaining Y values automatically. In both cases the internal representation of the lookup table is identical and is the same as that expected by the lkup1 function.

The second argument of lkup1 is an integer giving the number of rows in tbl. Generally this value is another member of the same parameter structure in which the tbl is defined.

The third argument of lkup1 is the X value whose corresponding Y value is to be determined. lkup1 returns the corresponding Y value.

lkup2 Table look-up without interpolation

SUMMARY

```
NUMBER lkup2(tbl, tblnum, input);

NUMBER tbl[][3];
int tblnum;
NUMBER input;
```

The lkup2 function is used to perform table look-ups without interpolation. Expressed another way, lkup2 evaluates step functions.

The first argument (tbl) is the address of an SPSM look-up table, which is an n x 3 array of floating point numbers. The first two columns of tbl contain the (X,Y) pairs that define the left-most point of each step in the step function. The third column of tbl contains the slope of the segment that starts at the (X,Y) pair, but the lkup2 function only makes use of the (X,Y) pairs in the look-up table. The slopes, though always present in look-up tables, are not used.

The second argument of lkup2 is an integer giving the number of rows in tbl. Generally this value is another member of the same parameter structure in which the tbl is defined.

The third argument of lkup2 is the X value whose corresponding Y value is to be determined. lkup2 returns the corresponding Y value.

maxn Find the maximum of two numbers

SUMMARY

```
NUMBER maxn(x,y);

NUMBER x;
NUMBER y;
```

The maxn function returns the value of the larger of its two input arguments.

memo1 Compute memo items for reporting

SUMMARY

The `memo1` function is used to calculate several reporting variables as aggregates of other modeled variables. The function calculates all dollar denominated reporting variables up to the level of disposable income. In addition taxable filer status is determined.

SPSM Implementation

The `memo1` function operates at the individual level of analysis and skips individuals with no income. The algorithm first assigns filer status as relevant/non-relevant and taxable/non-taxable based on taxes paid and credits received. The function then calculates several reporting variables as follows.

ReportingVariable	Formula
imfoth =	iditogv + idinogv;
impoth =	ZERO;
imicqp =	idicqp;
immemp =	idiemp + idisenf + idisefm;
imminv =	idiroom + idiint + ididiv + idicapg + idioinv;
immoth =	idipens + iditoth + idinoth;
immmkt =	immemp + imminv + immoth;
imftran =	imffa + imioas + imiotg + imigis + imispa + imctc + imicqp + imfoth + imiuib + imfstc +imqtar + imqtaa + imfsa + imiosa;
impfp =	impfa + imqaafa + imqnbfa
imptran =	impfp + imigist + imptc + impsa;
immtran =	imptran + imftran;
immtot =	immmkt + immtran;
imftax =	imuic + imcqppc + imrepay + imtxf;
imptax =	imtxp;
immtax =	imftax + imptax;
immdisp =	immtot - immtax;

immicons =	immdisp; (initial assignment, may be re-assigned in memo2)

Relation to Other SPSM Routines

The memo1 function is called by drv immediately after the income tax and cash transfer algorithms have executed. It is called just before the execution of the commodity tax model (ctmod) which makes use of some of the aggregated output variables. The memo2 function follows ctmod to add information to the reporting variables calculated in the memo1 function.

CROSS REFERENCE

Function	Description
INPUT VARIABLES:	
hhnin	Number of individuals in household
idicapg	Capital gains (actual)
idicqp	CPP/QPP income (114)
ididiv	Dividend income (actual)
idiemp	Wages & salaries
idiint	Interest income (121)
idinogv	Other government income (non-taxable)
idinoth	Other money income (non-taxable)
idioinv	Other investment income with net rental
idipens	Pension income (115)
idiroom	Net income from roomers and boarders (126)
idisefm	Self-employed income - farming
idisenf	Self-employed income - non-farming
iditogv	Other government income (taxable)
iditoth	Other non-government income (taxable)
imbft	Basic federal tax
imcqppc	CPP/QPP contributions
imctc	Child tax credit
imfcben	Total Federal Child Benefits
imffa	Federal portion of family allowances
imfortc	Federal other refundable tax credits
imfsa	Federal social assistance
imfstc	Federal sales tax credit
imibcfb	B.C. Family Bonus
imigis	GIS benefits
imigist	GIS provincial top-up
iminet	Net income
imioas	OAS benefits
imiosa	Other SA or guarantees
imiotg	Other taxable demogrants
imisbspa	Federal Seniors Benefit SPA
imisenb	Federal Seniors Benefit
imispa	Spouse's allowance
imiuib	Unemployment Insurance\Employment Insurance benefits
imnbcben	Total NB child tax Benefits
imninc	No income flag
imoccea	Ont. Child Care Exp. credit allowed (Family)

```
impfa           Provincial family allowance
importc         Other refundable provincial tax credits
impsa           Provincial social assistance
imptc           Refundable provincial tax credits
imqaafa         Quebec Availability Allowance FA Supplement
imqnbfa         Quebec newborn Allowance
imqtar          Quebec tax abatement (refundable)
imrepay         Social Benefits Repayments
imtxf           Federal income tax payable
imtxp           Provincial income tax payable
imuic           UIC contributions

OUTPUT VARIABLES:
imctcben        Federal child tax credit and child benefits
imfiler         Taxable filer status
imfnewpg        Federal new programs
imfoth          Federal other government income
imfothtr        Federal other trans income and ref. credits
imftax          Federal taxes
imftran         Federal transfer income
imicqp          CPP/QPP payable
imiemp          Wages and salaries
imigispa        GIS and spouse's allowance
imiself         Total self-employment income
immdisp         Disposable income
immemp          All employment income
immicons        Consumable income
imminv          Investment income
immmkt          Market income
immoth          Other income
immtax          All taxes
immtot          Total income
immtran         All transfer income
impalltc        All refundable provincial tax credits
impfp           Provincial family programs
impoth          Provincial other government income
imptax          Provincial taxes
imptran         Provincial transfer income
```

memo2 Compute consumable income, etc.

SUMMARY

The `memo2` function is used to calculate several reporting variables as aggregates of other modeled variables. The function calculates all dollar denominated reporting variables up to the level of consumable income.

SPSM Implementation

The `memo2` function operates at the individual level of analysis and skips individuals with no

income. Aspects of the function are not executed if the commodity tax model has not been run (`CTMOD=0`). The function first adjusts several reporting variables calculated in memo1 as follows.

Reporting Variable	Formula
imftax =	imftax + imtxfc
imptax =	imptax + imtxpc
immtax =	immtax + imtxfc + imtxpc
immicons =	immdisp - imtxfc - imtxpc

The function next calculates additional reporting variables as follows.

Reporting Variable	Formula
imnettr =	immtran - immtax
imothrep =	imrepay - imuibr
imqta =	imqtaa + imqtar
imfedbal =	imftax - imftran
imprvbal =	imptax - imptran
impovinc =	immtot - imctc - imfstc

Relation to Other SPSM Routines

The memo2 function is called by `drv` immediately after the commodity tax algorithms (ctmod) have executed. The function adds information to the reporting variables calculated in the memo1 function.

Please refer to the *SPSD/M Variable Guide* for detailed descriptions of the variables listed above.

CROSS REFERENCE

Function	Description
INPUT PARAMETERS:	
CTFLAG	Commodity tax activation flag
INPUT VARIABLES:	
hhnin	Number of individuals in household
imftran	Federal transfer income
immdisp	Disposable income
immtot	Total income
immtran	All transfer income
imninc	No income flag
imptran	Provincial transfer income
imqtaa	Quebec tax abatement (applied)
imqtar	Quebec tax abatement (refundable)
imrepay	Social Benefits Repayments
imtxfc	Federal commodity taxes

```
imtxpc          Provincial commodity taxes
imuibr          UI benefit recovery

OUTPUT VARIABLES:
efin            First person in economic family [pointer]
idef            Person's economic family [pointer]
imfedbal        Federal taxes less transfers
imftax          Federal taxes
immicons        Consumable income
immtax          All taxes
imnettr         Net transfers to person
imothrep        Other federal repayments
impovinc        Income for low income measurement
imprvbal        Provincial taxes less transfers
imptax          Provincial taxes
imqta           Quebec tax abatement (total)
```

minn Find the minimum of two numbers

SUMMARY

```
NUMBER minn(x,y);

NUMBER x;
NUMBER y;
```

The minn function returns the value of the smaller of its two input arguments.

mpc Calculate derived model parameters and do edits

SUMMARY

The `mpc` function calculates derived model parameters and performs edit checks on input tax/transfer algorithm parameters. The function currently calculates derived parameters for use in the commodity tax (`ctmod`) function, the Guaranteed Income Supplement (`gis`) function, and the head/spouse transfer (`txhstr`) function. Performing the calculations in `mpc` increases the efficiency of the program by avoiding multiple calculations for every household. Edit checks are performed for aspects of the commodity tax model and the old age income system. Please refer to the appropriate section in the Algorithm Guide for details of the specific social and tax programs.

SPSM Implementation

Calculation of Derived Parameters

Two derived parameters for use in the `ctmod` are calculated: a total federal government

effective commodity tax rate (CTFTOT) and a total provincial government effective rate (CTPTOT). The federal rate is calculated by adding together the six detailed federal rates produced by the Input/Output model: CTFCID, CTPEXT, CTFMFG, CTFEXT, CTFOEN, and CTFRST. The aggregate provincial rate is calculated in the identical fashion, summing up the 7 provincial rates: CTPRST, CTPICT, CTPLGL, CTPPLQ, CTPTOB, CTPGAS, and CTPAMU.

These parameters are used to ensure equivalent results between the detailed and non-detailed commodity tax model options. When the detailed option is turned off (i.e. the CTDET flag is set to zero), commodity tax revenues are produced by multiplying the two aggregate rates by the total expenditure of each household. This requires a fraction of the operations for each household when compared to the detailed method.

A single derived parameter, UIBRA, is calculated for use in the `txitax` function. This parameter contains the individual's UIC repayment base amount and is derived from two further parameters: UIBFA, the UI benefit recovery base amount factor, and UIERNMAX, the dollar value of maximum insurable earnings. Please refer to section in this manual for further information on the `txitax` function.

Three derived parameters are calculated for use in the `gis` function. The income breakeven points for GIS/SPA couples and married 1 pensioner couples are calculated here as GISBE1 and GISBE2 respectively. The breakeven points represent the level of family income at which combined GIS/SPA benefits are reduced to zero based on combined family income. They in turn are used to calculate an income crossover point (SPAXO) for the two types of pensioner couples (see following Chart).

GIS and SPA For Married Couples, 1 is not an OAS Pensioner

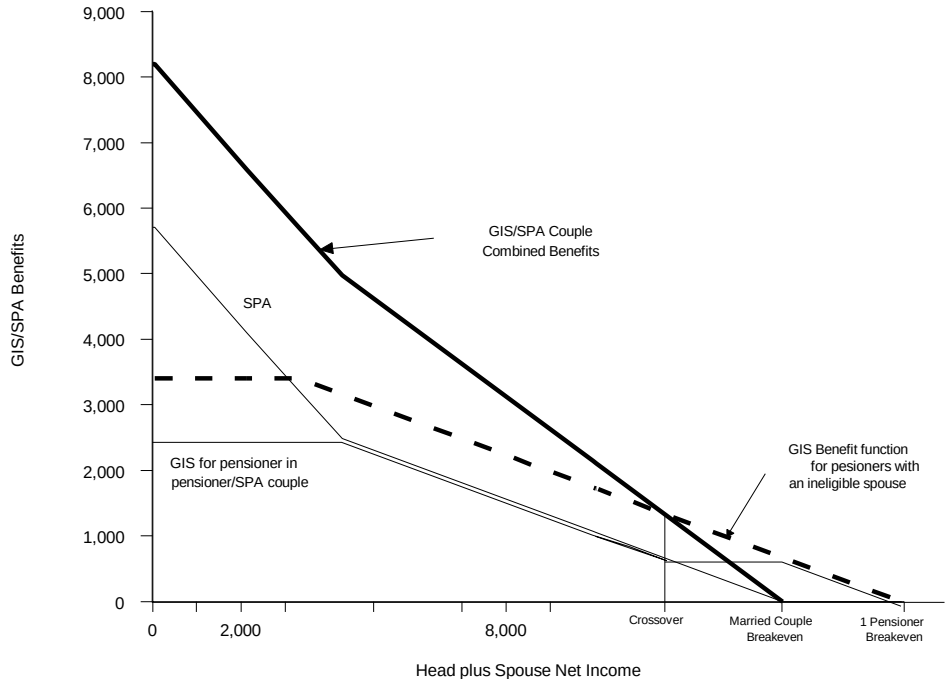

Figure 1 GIS/SPA Benefits for One OAS Pensioner Couples

GISBE1 represents the level of family income at which the GIS benefits of a pensioner married to a non pensioner have been reduced to exactly zero. On the figure above this is the point on the X axis labelled "1 Pensioner Breakeven". The value is calculated as a fixed relationship to other input parameters as follows.

```
GISBE1 = BGISS/GISRRM + BOAS + GISRLS
```

GISBE2 represents the level of family income at which the combined GIS and SPA benefits of a pensioner married to a SPA recipient have been reduced to exactly zero. On the figure above this is the point on the X axis labelled "Married Couple Breakeven".

```
GISBE2 = (BGISM*2)/(GISRRM*2)+BOAS/SPAOASRR+GISRLM
```

SPAXO represents the level of family income at which the dollar benefits for GIS to a single pensioner married to a non-pensioner spouse exactly equal the combined GIS/SPA dollar benefits payable to a GIS/SPA married couple. On the figure above this is the point on the X axis labelled "Crossover". The value is calculated as a fixed relationship to other input parameters as follows.

```
SPAXO = 2*GISBE2-GISBE1
```

Please refer to the Guaranteed Income Supplement Section of this guide for further details on the use of these derived parameters.

For all of the parameters described above users may refer to the *SPSD/M Parameter Guide* for further information.

Edit Checks

Three parameter edit checks are currently implemented in the `mpc` function.

- If the 1988 tax reform is activated using the PEROPT parameter (which controls the treatment of the basic personal exemptions/ tax credits), then a check is made to ensure that the tax credit rate parameter FNTCR is non-zero. If zero, an error message is issued but processing continues.

- A similar check is made to ensure that the tax credit rate is non-zero if the Quebec 1988 tax reform is enabled sing the QREFOPT parameter. Error handling is also the same as above.

- If the CTFLAG parameter is set to 1 (thereby specifying that commodity taxes will be calculated) and the FXVFLAG parameter is set to 0 (indicating no FAMEX expenditure data is to be read) then an error message will result and CTFLAG will be reset to 0 and no commodity taxes will be calculated.

- If the OAS algorithm is switched off (OASFLAG=0) and the GIS algorithm is switched on (GISFLAG=1) GIS benefits will be incorrectly calculated as they depend on variables calculated in the oas function. If this condition is met an error message will result and GISFLAG will be set to 0 and consequently no GIS benefits will be calculated.

- If the GIS algorithm is switched off (GISFLAG=0) and the provincial GIS supplement algorithm is switched on (GISTFLAG=1) provincial GIS supplement benefits will be incorrectly calculated as they depend on variables calculated in the gis function. If this condition is met an error message will result and GISTFLAG will be set to 0 and consequently no provincial GIS supplement benefits will be calculated.

Relation to Other SPSM Routines

The `mpc` function is called before drv and as such is only executed once for every program run. The function currently calculates parameters and performs edits which can effect a number of functions directly; the ctmod function, the gis function, the gist function, the `txitax` function, and the head/spouse transfer `txhstr` function.

CROSS REFERENCE

Function	Description
INPUT PARAMETERS:	
FXVFLAG	Read FAMEX expenditure vector file
BGISM	Basic GIS - married
BGISS	Basic GIS - single
BOAS	Basic OAS
CTFCID	Federal custom import duties [com]
CTFEXD	Federal excise duties [com]
CTFEXT	Federal excise taxes [com]
CTFGST	Federal GST [com]
CTFMFG	Federal manufacturer's sales [com]
CTFOEN	Federal other energy taxes [com]
CTPAMU	Provincial amusement tax [prov]
CTPGAS	Provincial gasoline tax [prov]
CTPLGL	Provincial liquor gallonage tax [prov]
CTPPLQ	Provincial profits on liquor commissions [prov]
CTPRST	Provincial retail sales tax [com x prov]
CTPTOB	Provincial tobacco tax [prov]
FNTCR	Federal non-refundable tax credit rate
GISRLM	Basic GIS reduction level: married pensioners
GISRLS	Basic GIS reduction level: single pensioners
GISRRM	Basic GIS reduction rate: married pensioners
OASFLAG	Old age security flag
PEROPT	Personal exemption/credit option [1=deduction,2=credit]
QNTCR	Quebec nominal tax credit rate
QREFOPT	Quebec deduction/credit option [1=deduction,2=credit]
SPAOASRR	OAS portion of SPA taxback rate
UIBAF	UI benefit recovery base amount factor (UI and EI)
UIBAFNR	UI EI benefit recovery base amount factor for non-repeaters (EI only)
UIBASRATE	Benefit rate for basic phase (UI only)
UIEIHWCF	EI hours to weeks conversion factor (hours/week) (EI only)
UIEIMFSP	EI Maximum family supplement percent of earnings (EI only)

```
UIEIOPT         UI Employment Insurance reform option [1=UI, 2=EI Dec'95]
UIERNMAX        Maximum insurable earnings (UI and EI)

OUTPUT PARAMETERS:
CTFLAG          Commodity tax activation flag
CTFTOT          Federal total retail tax equivalent
CTPTOT          Provincial total retail tax equivalent
GISBE1          Breakeven for GIS one pensioner couple
GISBE2          Breakeven for GIS/SPA couple
GISFLAG         Federal GIS/SPA/ESPA flag
GISTFLAG        Provincial GIS top-up flag
SPAXO           Benefit Cross-over GIS/SPA vs GIS one pensioner couple
UIBRA           UI repayment base amount (UI and EI)
UIBRANR         EI repayment base amount for non-repeaters (EI only)
```

nneg Change negative numbers to zero

SUMMARY

```
NUMBER nneg(arg);

NUMBER arg;
```

The nneg function returns either zero or the value of arg, whichever is larger. In other words, nneg changes negative values to zero, leaving positive values unchanged.

oas Compute OAS for elderly

SUMMARY

The Old Age Security program provides taxable monthly benefits to all Canadians age 65 and over who meet the Canadian residency requirements. Benefits are either full or partial depending on a person's history of residency in Canada. The program is not income tested. The SPSM oas function is based on the age of the individual and, for immigrants, the years since immigration as reported at the time of the SCF survey in April 1985.

The Seniors Benefit program was added to the model based on the description provided with the 1996 Federal Budget. The Seniors Benefit will replace the OAS/GIS benefits in 2001. It will be a tax-free; income tested benefit which will be determined on the basis of the incomes from both spouses. The maximum benefits will be $120 more than the maximum OAS/GIS for 2001. These rates are fully indexed for inflation.

People aged 60 or over on December 31, 1995 will be able to choose to move to the Seniors Benefit or keep the existing OAS/GIS payments. The SPA program remains in place but is enriched by $120.

Program Description

As amended in 1957 and 1965 the OAS program provides full benefits to persons born in Canada or those having immigrated to Canada more than 10 years before their 65th birthday with no provisions for partial benefits. In June 1977 the program was modified to provide partial benefits to immigrants having resided in Canada for between 10 to 39 years at the time of their 65th birthday. These individuals are eligible for benefits in proportion to the number of years in Canada at age 65 divided by 40. Note that years of eligibility do not increase after the year of the beneficiary's 65th birthday. Thus an immigrant of twenty years at his/her 65th birthday would be eligible for 20/40 or 50% of full OAS benefits. Persons having immigrated to Canada less than ten years prior to their 65th birthday were ineligible for OAS until 1987. In that year the OAS program was modified to allow for immigrants from certain countries having reciprocal arrangements with Canada to use years of residency in the country of emigration to count towards meeting the minimum 10 years residency requirement. However, in these cases it is only the years of residence in Canada which are used to determine the rate of partial benefits.

SPSM Implementation

The oas function determines benefits based on the age of the individual and the years since immigration as reported at the time of the SCF survey in April 1985. Because OAS provides an individually determined benefit the simulation operates at the level of a household assigning benefits to all eligible individuals. The model first adjusts years since immigration in two ways:

1. It determines the years since immigration at the time of the potential beneficiary's 65th birthday. This is done by subtracting the difference between the individual's age and 65 years from the reported years since immigration. [immi = immi - (idage-65)]

2. It adjusts the immigration status of persons who were eligible for Full OAS under the original program specifications but would qualify for only partial benefits since 1977. This is done by setting the years since immigration to 40 for persons having 10 or more years since immigration at the time of their 65th birthday if that birthday was in 1977 or earlier. [immi =40 if(immi >=10 and TARGETYEAR- idage <= 12)]

Notice that the years since immigration for any given individual after adjustment number 1 will remain the same regardless of the year for which the simulation is being run. For example an immigrant of 38 years, age 73, would have an adjusted years since immigration of 30 years, (immi = (38-(73-65)=30). Because of adjustment 2 above that individual would receive full OAS benefits in simulations run for 1984 but would receive 75% partial benefits in simulations run for 1988. In other words, a pensioner who is 73 years old in 1984 would have been 65 years old in 1976; the year before partial benefits were introduced. However a 73 year old in 1988 would have been age 65 in 1980; after partial befits were introduced.

The model next determines if full eligibility requirements have been met for benefits and if so the full year equivalent of maximum OAS benefits are assigned (see BOAS in the *SPSD/M Parameter Guide*). Next, persons ineligible for OAS are screened out. Lastly, the

model assigns partial benefits to persons with an adjusted years since immigration of between 10 and 39 years.

With the new Senior Benefit program, first, the seniors benefit (senben.c) is calculated. Then cceopt calls drv again, and the benefit is zeroed out and OAS/GIS is calculated instead. For persons who lost under this change, drv is called a third time with the seniors benefit package.

Interpretation

The results of the model are not directly comparable with and thus will not match administrative OAS expenditure figures. The discrepancy arises due to administrative irregularities as well as survey data deficiencies.

There are five major sources of underestimation by the oas function. The benefits of persons having received benefits during 1984, yet who had died before the date of the survey, will not be accounted for in the SPSD/M. The survey coverage excludes native Canadians on reservations as well as persons living in the Yukon and North West Territories; thus the OAS benefits of these persons are excluded from SPSM totals. Published figures include payments to persons not residing in Canada as well as retroactive lump-sum payments for late applicants. A further provision not accounted for in this algorithm is the use of years of residence in another country to meet minimum residency requirements. This will not affect the model results if run in years before 1988. The effect is small in any case.

Due to the discrepancy between reported age on the SCF and actual age in 1984 overestimation of aggregate OAS benefits for persons aged 65 and 66 arises. For example 25% of those reporting their age as 65 in March of 1985, and thus receiving full OAS Benefits in SPSM, would actually have been born between January and March 1985 (assuming births are distributed approximately evenly by month). As such they would have actually received no OAS. Furthermore, the other 75% of the 65 year olds and 17% of 66 year olds would have actually received OAS for only part of 1984. Currently, the SPSM makes no stochastic adjustments for such cases.

Relation to Other SPSM Routines

OAS depends on the input parameters for basic OAS benefits and years since immigration. The calculation of OAS and other modeled variables occurs prior to and affects the calculation of net income and related GIS and GIS 'top-up' programs. The modeled benefits are reported in net income, elderly income, disposable income, transfer income, total income, consumable income. The oas function is called before txinet (calculation of individual net income) by drv.

CROSS REFERENCE

Function	Description
INPUT PARAMETERS:	
BOAS	Basic OAS
OASFLAG	Old age security flag
SBFLAG	Activate calculation of Seniors Benefit
SBOPTFLG	Optimize Seniors benefit with OAS/GIS
TARGETYEAR	Year of analysis
INPUT VARIABLES:	
hdageeld	Age of eldest in household
hdseqhh	Household sequence number
hhnin	Number of individuals in household
idage	Age
idimmi	Years since immigration
imsbz	Is Seniors Benefit Zeroed?
OUTPUT VARIABLES:	
imioas	OAS benefits
imninc	No income flag
imoaspar	Partial OAS residency flag
imoasres	Partial OAS fraction

pmaddent Define and add a parameter

SUMMARY

The pmaddent function is used to define a new parameter to the SPSM parameter manipulation facilities. Please see the *SPSM Programmer's Guide* for more information.

randrnd Randomly round a floating point number to an integer

SUMMARY

The randrnd() function can be used to round fractional quantities to integer values in such a way that the sum of the values will remain (virtually) unchanged. Conventional rounding techniques do not have this property. For example, say that we have a set of 1000 numbers, each of which has the value 0.1. The sum of this set of numbers is 100.0. If we round each member of this set to the nearest integer, the sum of values would become 0.0. If we rounded

randomly up or down, the sum would be 500. Neither of these rounding processes preserve the original sum. What we wish to do is to round 100 of the values up to 1.0 and 900 of the numbers down to 0.0. The randrnd() function simplifies this process.

The first argument to randrnd() is the value which is to be integerized, while the second is a uniformly distributed random number between 0.0 and 1.0 used to perform the rounding. The second argument is normally one of the built-in random number streams created by the SPSM Random Number Facility (see the *SPSM Users' Guide* for more details on this facility). The result of randrnd() is an unbiased, randomly rounded integerized value. In the following example, the variable invalid has the value 2.0 for 30% of the time and 3.0 for 70% of the time.

```
intval = randrnd(2.7, idrand0);
```

The randrnd() function can be used to simplify operations such as the production of alternate weight files. For a specific example, see the description of the bldwgt50.exe utility found in the *SPSM Tools Users Manual.*

The vardef function (actually a macro) is used to define a new variable to the facilities of the SPSM that make use of variables. Please see the *SPSM Programmer's Guide* for more information.

round Round to nearest integer

SUMMARY

```
NUMBER round(arg);

NUMBER arg;
```

The round function converts its argument to the nearest whole number.

sa Compute social assistance or guarantees

SUMMARY

Social assistance payments are not currently calculated by the SPSM. Data requirements are too great for a detailed micro-simulation. For example, the database contains no information on the holding or recent sale of liquid or fixed assets. This function is currently used to create a variable for social assistance by manipulating social assistance payments reported by the elderly (idisa) and GIS supplementation programs and other forms of social assistance (imigist). In addition, the splitting of Social Assistance payments between the federal and provincial governments is performed here. It is also intended as a function in which algorithms for social assistance or other guarantees can be developed by glass box users.

Program Description

There are a number of federal, provincial and municipal programs which provide some form of social assistance payments to various target groups. The SPSM simulates six GIS supplementation programs (see the description of the gist function) which are classified with the other social assistance programs by the SCF. In fact the SCF records benefits received from over 30 provincial and municipal social assistance programs under one title of which six are simulated by the SPSM. This algorithm is designed to ensure no double counting of provincial GIS supplement program benefits occurs between simulated social assistance (imisa) and the provincial GIS supplement programs (imigist).

SPSM Implementation

If the function is deactivated with SAFLAG, no social assistance benefits are reported for any individual. If the function is turned on the database values of reported Social Assistance payments is used as the reported value of social assistance for all persons under the age of 65. For persons aged 65 and over there are three possible means of calculating social assistance which are controlled by the SAELDOPT parameter. These options are as follows.

- Social assistance is set to zero for all persons aged 65 and over.

- For individuals over age 64 who received simulated Provincial GIS supplementation benefits Social Assistance benefits are set to zero. If no Provincial GIS supplement is assigned to an individual over age 64, the simulated social assistance reported by the SPSM is the same as the reported value on the database.

- For all individuals over the age of 64 the value of simulated social assistance is set to the positive difference between reported and simulated social assistance.

In addition to performing the calculations for Social Assistance, sa computes the splitting of payments between the Federal and Provincial governments. This splitting corresponds to the federal/provincial cost sharing agreements in the Canada Assistance Plan.

The payment splitting is controlled by the parameter SAFS which is the federal proportional share of SA benefits. This parameter is available to be changed in black box mode and will determine the value of the variable imfsa which represents the value of the federal share. The provincial share of SA benefits is calculated as the difference between total SA benefits and the calculated federal amount and is represented by the variable impsa.

Relation to Other SPSM Routines

The sa function is called by drv after the calculation of provincial GIS supplements in gist.

CROSS REFERENCE

Function	Description

```
INPUT PARAMETERS:
SAELDOPT        SA for elderly calculation method [1=~SA,2=GIST-
>~SA,3=diff]
SAFLAG          Social assistance flag
SAFS            Federal share of social assistance [prov]
SFAOUT          Proportion of social assistance to eliminate

INPUT VARIABLES:
cfin            First person in census family [pointer]
cfnpers         Number of persons in census family
hdprov          Province
hhncf           Number of census families in household
idage           Age
idisa           Social assistance income
imigist         GIS provincial top-up

OUTPUT VARIABLES:
imfsa           Federal social assistance
imisa           Social assistance (or replacement program)
imninc          No income flag
impsa           Provincial social assistance
```

senben Compute Seniors Benefit for elderly

SUMMARY

The Seniors Benefit program was added to the model based on the description provided with the 1996 Federal Budget. The Seniors Benefit will replace the OAS/GIS benefits in 2001. It will be a tax-free income tested benefit which will be determined on the basis of the incomes from both spouses. The maximum benefits will be $120 more than the maximum OAS/GIS for 2001. These rates are fully indexed for inflation.

There are six family types considered by the program.

GIS/SPA Type	Family Status
1. Single Pensioner:	Unattached Individual, OAS Pensioner
2. Widowed Pensioner:	Unattached Individual, Age 60-64, Widowed
3. Married 2 Pensioner:	Married Couple, Both OAS pensioners
4. Married pensioner with SPA spouse:	Married Couple, OAS Pensioner with SPA recipient

5. Married pensioner with older spouse non-pensioner:	Married couple, 1 OAS pensioner, spouse ineligible for OAS or SPA is the older
6. Married pensioner with younger spouse non-pensioner:	Married couple, 1 OAS pensioner, spouse ineligible for OAS or SPA is the younger

The maximum benefit is reduced in two steps. The first step is analogous to GIS. The benefit is reduced at a first step rate associated with the family type, for all income over the first step threshold. The result cannot be reduced to anything smaller than imsboas, which is the OAS portion of the seniors benefit. The length of residency in Canada affects imsboas. The resulting Seniors Benefit is then reduced at the second step rate for all incomes over the second step threshold.

People aged 60 or over on December 31, 1995 will be able to choose to move to the Seniors Benefit or keep the existing OAS/GIS payments. The SPA program remains in place but is enriched by $120.

SPSM Implementation

The SPSM derives the Seniors Benefit in the following way. First, the eligibility for the program depending on the length of residency in Canada is calculated. The total income that will be used to derive the amount of the benefit is then calculated. For married couples, the income from both spouses is included. The previous year's income is estimated as

Net Income = PYINC *	Deflator To Simulate Previous Years Income
Imicapgt	Taxable Capital Gains
+ ididiv	Dividends Received
+ idiint	Investment Income
+ idiemp	Employment Income
+ idisenf	Non-Farm Self Employment Income
+ idisefm	Farm Self Employment Income
+ idioinv	Other Investment Income
+ iditoth	Other Income
+ idiroom	Income From Roomers
+ idicqp	CPP/QPP Benefits
+ idipens	Private Pension Income
+ iditogv	Other Taxable Government Transfers
+ imiuib	Unemployment Insurance Benefits
- imalexp	Other allowable Employment Expenses
- imcqppc	CPP/QPP Contributions
- imuic	Unemployment Insurance Contributions

The model then derives the Seniors Benefit for six different types of seniors.

1) Eligible single persons 65 and over

The maximum benefit (imsbmax) is derived as SBBENS + SBPREM, where SBBENS is the amount which a single pensioner could have received under OAS/GIS under full indexation.

The benefit is then reduced in two steps. The first step is analogous to GIS. The benefit is reduced at a rate SBRR1 for all income over GISRLS (this is a small amount which prevents tiny cheques). The result cannot be reduced to anything smaller than imsboas, which is the OAS portion of the seniors benefit. The length of residency in Canada affects imsboas, but under full residency requirements it is defined as SBRL1. The resulting Seniors Benefit is then reduced at a rate SBRR2 for all income over SBRL2.

2) Widow or Widower aged 60-64

The maximum benefit (imsbmax) is derived as SBSPA + SBRL1 + SBPREM. The benefit is reduced for income over the reduction level SBARL, at the rate SPAOASRR for the OAS portion of the benefit and GISRRS for the GIS portion of the benefit.

3) Couple with both spouses over 65 and eligible for the Seniors Benefit

The maximum benefit (imsbmax) for each spouse is derived as SBBENM + SBPREM, where SBBENM is the maximum amount which single person could have received under OAS/GIS under full indexation. The benefit is then reduced in two steps. The first step is analogous to GIS. The benefit is reduced at a rate SBRR1/2 for all income over GISRLM (this is a small amount which prevents tiny cheques). The benefit cannot be reduced to anything smaller than imsboas, which is the OAS portion of the seniors benefit. The length of residency in Canada affects imsboas, but under full residency requirements it is defined as SBRL1. The resulting Seniors Benefit is then reduced at a rate SBRR2/2 for all income over SBRL2. The income used is the income of both spouses, and halving the reduction rates (SBRR1, SBRR2) means that both spouses will receive identical amounts.

4) Couple with the youngest spouse eligible for Spouse's Allowance and the oldest spouse eligible for the Seniors Benefit

The benefit for the older spouse is derived in the same manner as for couples with both spouses eligible for the Seniors Benefit (case 3). The youngest spouse's maximum benefit is defined as BOAS + GISM + SBPREM. The spouse's benefit is reduced using the SPARL reduction level, the OAS portion of the taxback rate (SPAOASRR), and the GIS portion of the taxback rate (GISRRM).

5) Couple with the youngest spouse eligible for the Seniors Benefit but not the older spouse

The benefit is derived in the same manner as for eligible single persons over 64 (case 1).

6) Couple with the oldest spouse eligible for the Seniors Benefit but not the younger spouse

The benefit is derived in the same manner as for eligible single persons over 64 (case 1).

Relation to Other SPSM Routines

In order to optimize eligible persons benefits with the OAS/GIS programs, the seniors benefit

is optimized for these seniors. First, the seniors benefit is calculated. Then cceopt calls drv again, and the benefit is zeroed out and OAS/GIS is calculated instead. For persons who lost under this change, drv is called a third time with the seniors benefit package. See oas, gis, and cceopt for more information on this optimization procedure.

CROSS REFERENCE

Function	Description
INPUT PARAMETERS:	
BGISM	Basic GIS - married
BOAS	Basic OAS
GISOASFLAG	1984 GIS top-up to OAS residence shortfall flag
GISRLM	Basic GIS reduction level: married pensioners
GISRLS	Basic GIS reduction level: single pensioners
GISRRM	Basic GIS reduction rate: married pensioners
GISRRS	Basic GIS reduction rate: single pensioners
PYINC	Deflator to calculate previous year income
SBBENM	Seniors Benefit maximum rate for couples
SBBENS	Seniors Benefit maximum rate for singles
SBFLAG	Activate calculation of Seniors Benefit
SBOPTFLG	Optimize Seniors benefit with OAS/GIS
SBPREM	Seniors Benefit premium over GIS
SBRL1	Seniors Benefit first benefit reduction plateau
SBRL2	Seniors Benefit Second reduction level
SBRR1	Seniors Benefit First reduction rate
SBRR2	Seniors Benefit Second Reduction Rate
SBSPA	Seniors Benefit maximum rate for SPA
SPAOASRR	OAS portion of SPA taxback rate
SPARL	SPA reduction point: one married/ widowed
INPUT VARIABLES:	
hhnnf	Number of nuclear families in household
idage	Age
idicqp	CPP/QPP income (114)
ididiv	Dividend income (actual)
idiemp	Wages & salaries
idiint	Interest income (121)
idioinv	Other investment income with net rental
idipens	Pension income (115)
idiroom	Net income from roomers and boarders (126)
idisefm	Self-employed income - farming
idisenf	Self-employed income - non-farming
iditogv	Other government income (taxable)
iditoth	Other non-government income (taxable)
idmarst	Marital status
imalexp	Allowable employment expenses
imcqppc	CPP/QPP contributions

```
imicapgt        Capital gains (taxable)
imiuib          Unemployment Insurance\Employment Insurance benefits
imoaspar        Partial OAS residency flag
imoasres        Partial OAS fraction
imsbz           Is Seniors Benefit Zeroed?
imuic           UIC contributions
nfageeld        Age of eldest in nuclear family
nfineld         Eldest person in nuclear family [pointer]
nfinspo         Spouse of eldest [pointer]
nfspoflg        Nuclear family contains married couple

OUTPUT VARIABLES:
imisbspa        Federal Seniors Benefit SPA
imisenb         Federal Seniors Benefit
imninc          No income flag
imoldtyp        Type of GIS/SPA nuclear family
imsbinc         Individual income reducing Seniors Benefit
imsbmax         Federal Seniors Benefit maximum benefit
imsboas         Federal Seniors Benefit OAS portion
imsbtyp         Type of Seniors Benefit entitlement
imspatyp        Type of SPA entitlement
```

strn — Retrieve string by string number

SUMMARY

The strn function is used by the SPSM to print prompts and error messages in a language-independent way. The argument to the function identifies which string is to be retrieved. strn retrieves the string from a language-specific database of strings into an internally-maintained buffer and returns a pointer to the retrieved string. This function is not intended to be used by the SPSM user, and is documented here for reference purposes only.

taxbak1 — One level tax-back function

SUMMARY

```
NUMBER taxbk1(inc, exmpt, lvl1, rr1);

NUMBER inc;      /* income subject to tax back            */
NUMBER exmpt;    /* exemption on income for tax back      */
NUMBER *lvl1;    /* level of benefit                      */
NUMBER rr1;      /* reduction rate for tax-back           */
```

The taxbk1 function is used to reduce a benefit at a fixed rate based on income in excess of a specified exemption level. If the benefit (*lvl1) is reduced to zero, taxbk1 returns the amount of income 'unused' in the reduction process. In other words, the return value represents the income in excess of the break-even income for the benefit.

taxbak2 Two level tax-back function

SUMMARY

```
NUMBER taxbk2(inc, exmpt, lvl1, rr1, lvl2, rr2)

NUMBER inc;      /* income subject to tax back       */
NUMBER exmpt;    /* exemption on income for tax back */
NUMBER *lvl1;    /* level (#1) of benefit            */
NUMBER rr1;      /* reduction rate (#1) for tax-back */
NUMBER *lvl2;    /* level (#2) of benefit            */
NUMBER rr2;      /* reduction rate (#2) for tax-back */
```

The taxbk2 function is used to reduce a two-tiered benefit at a fixed rates based on income in excess of a specified exemption level. The first tier benefit (*lvl1) is first reduced at rate rr1 based on income (inc) in excess of the specified threshold (exmpt). If the first tier benefit is reduced to zero, the second tier of benefit (*lvl2) is reduced at rate rr2 based on remaining income. If the second tier benefit (*lvl2) is reduced to zero, taxbk2 returns the amount of income 'unused' in the reduction process. In other words, the return value represents the income in excess of the break-even income for the benefit.

txalta Compute provincial taxes for Alberta

SUMMARY

Program Description

Calculation of the Alberta taxes.

Basic Alberta Tax (imbpt) is a proportion (APTF) of Basic Federal Tax (imbft). A tax reduction is calculated as a basic amount (ATRBC) minus a proportion (ATRF) of Basic Alberta Tax (imbpt). Alberta Tax Payable (imtxp) is calculated as Basic Alberta Tax (imbpt) minus the tax reductions.

Calculation of the Alberta Family Employment Tax Credit.

When the parameter AFETCFLAG is set to 1, the value of imiafetc variable is calculated as a percentage (AFETCBR) of nuclear family employment income above a threshold (AFETCCI) to a maximum dollar level which is calculated as AFETCBPC times the number of eligible children (nfnkids) up to a maximum number of children of AFETCNC. The maximum benefit is reduced by a percentage (AFETCRR) of nuclear family net income in excess of the threshold AFETCTD.

CROSS REFERENCE

Function	Description
INPUT PARAMETERS:	
AFETCBPC	Alberta Family Employment Tax Credit Benefit Per Child
AFETCBR	Alberta Family Employment Tax Credit Benefit Rate
AFETCCI	Alberta Family Employment Tax Credit Benefit Cut-in Level
AFETCNC	Alberta Family Employment Tax Credit Maximum Number of Children
AFETCRR	Alberta Family Employment Tax Credit Reduction Rate
AFETCTD	Alberta Family Employment Tax Credit Turndown Level
AFTAX	Alberta flat surtax rate on taxable income
APTC	Alberta political contribution table [total donations,donation allowed]
APTCBEN	Maximum Alberta political tax credit allowed
APTF	Alberta provincial tax fraction
ASCI	Alberta surtax cut-in
ASF	Alberta surtax fraction
ATRBC	Alberta tax reduction basic claim
ATRF	Alberta tax reduction fraction
INPUT VARIABLES:	
hhnin	Number of individuals in household
hhnnf	Number of nuclear families in household
idiemp	Wages & salaries
idisefm	Self-employed income - farming
idisenf	Self-employed income - non-farming
idprvftc	Provincial foreign tax credit (Form T2036)
idprvpol	Provincial political contributions (565)
idsex	Sex
imbft	Basic federal tax
iminet	Net income
imisa	Social assistance (or replacement program)
imitax	Taxable income
nfineld	Eldest person in nuclear family [pointer]
nfinspo	Spouse of eldest [pointer]
nfnkids	Number of children in nuclear family
nfspoflg	Nuclear family contains married couple
OUTPUT VARIABLES:	
imbpt	Basic provincial tax
imiafetc	Alberta Family Employment Tax Credit Benefits
imninc	No income flag
imnptc	Non-refundable provincial tax credits
impfp	Provincial family programs
impnit	Provincial net income tax
impptc	Provincial Political Contrib Tax Credit
impsur	Provincial surtax
imptr	Provincial tax reduction
imtxp	Provincial income tax payable

SUMMARY

Basic British Columbia Tax (imbpt) is a proportion (CPTF) of Basic Federal Tax (imbft). British Columbia Tax Payable (imtxp) is the Basic Tax plus the BC Surtax plus the BC Health Care Maintenance Surtax.

The BC Surtax is a proportion (CSF) of Basic BC Tax (imbpt) exceeding the surtax level (CSCI). The BC Health Care Maintenance Surtax is a proportion (CHCM) of BC Tax after the surtax has been added.

For some years, the amount of BC Tax payable may be reduced by setting BC Tax Payable (imtxp) to Federal Tax Payable (imtxf) if Net Income (iminet) is below a specified limit (CPTC). This option is eliminated by setting CPTC to zero.

B.C. Family Bonus

Total benefits received under the British Columbia Family Bonus program commencing in July 1996.

When the parameter BCFBFLAG is set to one the value of this variable is calculated as BCFBBAS times the number of children in the nuclear family (nfnkids) reduced by a proportion of head plus spouse net income (iminet + imisa) above the turndown of BCFBTD. This proportion for families with one child is BCFBRRS and for multiple child families is BCFBRR. The value calculated in this manner is multiplied times the parameter BCFBPI.

B.C. Family Bonus benefits (imibcfb) are assigned to the mother if present, or if not to the head of the nuclear family.

CROSS REFERENCE

Function	Description
INPUT PARAMETERS:	
BCFBBAS	B.C. Family Bonus amount per child
BCFBFLAG	Activate B.C. Family Bonus Program
BCFBPI	B.C. Family Bonus phase-in
BCFBRR	B.C. Family Bonus multiple child reduction rate
BCFBRRS	B.C. Family Bonus single child reduction rate
BCFBTD	B.C. Family Bonus Turndown

```
CHCM            British Columbia provincial health care surtax
CPTC            British Columbia provincial tax reduction cut-in
CPTCBEN         Maximum B.C. political tax credit allowed
CPTCT           B.C. political contribution table [total donations,donation
allowed]
CPTF            British Columbia provincial tax fraction
CRFLAG          British Columbia rental reduction flag
CRTRB           British Columbia renter tax reduction basic credit
CRTRD           British Columbia renter tax reduction credit for other
dependants
CRTRP           British Columbia renter tax reduction proportion of rent
allowed
CRTRPN          British Columbia renter tax reduction proportion of net
income
CRTRS           British Columbia renter tax reduction credit for spouse
CRTRT           B.C. renter tax reduction base amount turndown [dependants,
amount]
CSCI            British Columbia surtax first cut-in level
CSCI2           British Columbia surtax second cut-in level
CSDC            British Columbia provincial surtax dependant credit
CSF             British Columbia surtax first level rate
CSF2            British Columbia surtax second level rate
CSTC            British Columbia stc amount
CSTCFLAG        British Columbia sales tax credit flag
CSTCR           British Columbia stc reduction rate
CSTHINC         British Columbia cf head income threshold (stc)
CSTKINC         British Columbia kid income threshold top-up (stc)
CSTSINC         British Columbia spousal income threshold top-up (stc)
CTCINC          CTC family income scaling factor
CVCFLAG         British Columbia venture capital tax credit flag
CVCMAX          British Columbia maximum annual venture capital tax credit
PYINC           Deflator to calculate previous year income

INPUT VARIABLES:
cfnkids         Number of children in census family
cfnpers         Number of persons in census family
hhnin           Number of individuals in household
hhnnf           Number of nuclear families in household
idage           Age
idcf            Person's census family [pointer]
idcfrh          Relationship to census family head
idinspo         Person's spouse [pointer]
idnf            Person's nuclear family [pointer]
idprvftc        Provincial foreign tax credit (Form T2036)
idprvpol        Provincial political contributions (565)
idsex           Sex
idspoflg        Person has spouse
idvencap        Venture capital tax credit (564)
imbft           Basic federal tax
imchclm         Number of dependent children claimed
imigis          GIS benefits
iminet          Net income
imisa           Social assistance (or replacement program)
imispa          Spouse's allowance
imitax          Taxable income
immarex         Married exemption claimed
immartxc        Married tax credit claimed
```

```
imrentpd        Imputed rent paid
imtxf           Federal income tax payable
nfineld         Eldest person in nuclear family [pointer]
nfinspo         Spouse of eldest [pointer]
nfnkids         Number of children in nuclear family
nfspoflg        Nuclear family contains married couple

OUTPUT VARIABLES:
imbpt           Basic provincial tax
imibcfb         B.C. Family Bonus
imninc          No income flag
imnptc          Non-refundable provincial tax credits
impptc          Provincial Political Contrib Tax Credit
impsur          Provincial surtax
imptc           Refundable provincial tax credits
imptr           Provincial tax reduction
imtxp           Provincial income tax payable
```

txcalc Calculate federal income tax

SUMMARY

This function incorporates algorithms for the following tax measures to complete the calculation of federal taxes payable:

- Federal Dividend Tax Credit
- Basic Federal Tax (including tax credits transfers from dependents or spouse)
- Federal Tax Reduction (including transfer to spouse)
- Federal Surtax
- Federal Taxes Payable
- Alternate Minimum Tax
- Quebec Tax Abatement

Federal Dividend Tax Credit

If the filer declared dividends from taxable Canadian corporations, he or she is eligible to claim the Dividend Tax Credit which amounts to a fixed proportion of taxable dividends. This credit is non-refundable, i.e., it may be used to reduce Basic Federal Tax, but an unused portion is not refunded.

SPSM Implementation

The Federal Dividend Tax Credit (imfdtxc) is calculated as a proportion (FDTCR) of Net Taxable Dividends (imidivt). The amount is added to Total Nontransferable Tax Credits (imtaxcr) which is applied to reduce Basic Federal Tax (imbft).

Basic Federal Tax

Basic Federal Tax is defined as Federal Tax Payable on Taxable Income minus certain tax credits. Before 1988, only the Federal Dividend Tax Credit and Scientific Research Tax Credit were subtracted in the calculation of Basic Federal Tax. If deductions are converted to tax credits, as proposed in the June, 1987 White Paper on Tax Reform, then these tax credits are subtracted as well.

SPSM Implementation

Basic Federal Tax (imbft) is calculated the same way whether or not the tax credits proposed by the White Paper are applied. First, Federal Tax Payable on Taxable Income (imfedtax) is calculated using the interpolating lookup function lkup1 to determine taxes payable on Taxable Income (imitax) from the table FTX.

Dependants are treated separately from the head and spouse since the rules applying to the transfer of deductions from dependant to parent differ from those applying to the transfer of deductions from the spouse.

Transfers from Dependant to Parent

In calculating the dependant's Basic Federal Tax, the following nontransferable credits are subtracted from imbft:

- Basic Personal Tax Credit (imbtc)
- Age Tax Credit (imatxc)
- Charitable Donations Tax Credit (imchartc)
- CPP/QPP Contributions Tax Credit (imcppctc)
- Federal Dividend Tax Credit (imfdtxc)
- Medical Expense Tax Credit (immedatc)
- Pension Income Tax Credit (impentxc)
- UI Contributions Tax Credit (imuictc)

If any of these tax credits has not been calculated, for example, in a pre-reform scenario, most of these credits will have been set to zero.

A dependant may transfer an unused portion of certain tax credits to a supporting parent. Since a limit may be imposed on the amount of the combined Education Tax Credit and Tuition Tax Credit, these are treated separately from the Disability Tax Credit.

If a dependant requires all transferable tax credits to further reduce Basic Federal Tax, i.e., Basic Federal Tax (imbft) exceeds Total Transferable Tax Credits, then the tax credits are subtracted from imbft and no transfer occurs.

If the dependant's Total Transferable Tax Credits (txcrt) exceeds Basic Federal Tax, imbft is reduced to zero and the amount potentially transferable to a supporting parent is calculated as the amount of Disability Tax Credit (imdisatc) not required to reduce Basic Federal Tax plus the lesser of:

a) the combined Education and Tuition amount not required to reduce Basic Federal Tax to

zero, and

b) the maximum transferable of the combined Education and Tuition amount (MAXET)

The actual amount transferred (imttxcrt) is calculated by reducing the amount potentially transferred (ttxcrt) by a proportion (FNTCR) of Net Income (iminet) exceeding the Tax Credit Transfer Reduction Level (BXM).

The total amount of tax credits transferable from all dependents is accumulated in the variable ctxcrt which is subsequently used to reduce Basic Federal Tax for the parent with the higher Net Income (iminet).

These algorithms do not allow the partitioning of the dependant's tax credits between both supporting parents and, therefore, in some cases, the total taxes paid by the family may not be minimized.

Transfers From Spouse

In calculating the Basic Federal Tax of the head and spouse, the following nontransferable credits are subtracted from imbft:

- Basic Personal Tax Credit (imbtc)
- Child Care Expense Tax Credit (imccetx)
- Charitable Donations Tax Credit (imchartc)
- CPP/QPP Contributions Tax Credit (imcppctc)
- Tax Credit for Dependent Children (imctxcs)
- Federal Dividend Tax Credit (imfdtxc)
- Married Tax Credit (immartc)
- Medical Expense Tax Credit (immedatc)
- UI Contributions Tax Credit (imuictc)

If any of these tax credits have not been calculated, for example, in a post-reform scenario, most of these tax credits will have been set to zero.

An unused portion of certain transferable tax credits may be transferred from the spouse. The transferable tax credits are:

- Age Tax Credit (imatxc)
- Disability Tax Credit (imdisatc)
- Pension Income Tax Credit (impentxc)
- Education Tax Credit (imedtxc)
- Tuition Tax Credit (imtutxc)

Since a limit may be imposed on the amount of the combined Education and Tuition Tax Credits, these are treated separately from the others.

If the filer requires all Transferable Tax Credits (txcrt) to reduce Basic Federal Tax (i.e., imbft exceeds txcrt) then the tax credits are subtracted from Basic Federal Tax and no transfer occurs.

If the filer's Transferable Tax Credits (txcrt) exceed Basic Federal Tax, then imbft is reduced to zero and the remainder of the Potentially Transferable Tax Credits (ttxcrt) is calculated as the sum of:

- Disability Tax Credit (imdisatc)
- Age Tax Credit (imatxc)
- Pension Income Tax Credit (impentxc)

which is not required to reduce Basic Federal Tax to zero plus the lesser of:

a) the combined Education and Tuition amount not required to reduce Basic Federal Tax to zero, and
b) the maximum transferable of the combined Education and Tuition amount (MAXET)

The actual amount transferred (imttxcrt) is calculated by reducing the amount potentially transferred (ttxcrt) by a proportion (FNTCR) of Net Income (iminet) exceeding the Tax Credit Transfer Reduction Level (BXM).

Although this value is calculated for both head and spouse, the one with the higher Net Income (iminet) actually receives the transfer. The amount transferred from the spouse is stored in the variable imstxcrt. The amount transferred from all dependents is stored in imctxcrt.

Federal Tax Reduction

Before 1986, all filers were eligible for a Federal Tax Reduction. Before 1984, this amounted to a fixed tax credit independent of taxes payable. In 1984 and 1985, the reduction itself was reduced by a proportion of Basic Federal Tax exceeding a certain limit. The unused portion of the tax reduction was transferable to the filer's spouse.

SPSM Implementation

The Federal Tax Reduction Available (imftr) is calculated for each filer as a fixed amount (MXFTR) reduced by a proportion (FTRRR) of Basic Federal Tax (imbft) exceeding the Reduction Level (FTRRL).

If the head or spouse do not require the entire Federal Tax Reduction Available to reduce Basic Federal Tax to zero, then the remainder (hftrt for head, sftrt for spouse) is added together into imftrt and then summed with the other spouse's Federal Tax Reduction (imftr).

The Federal Tax Reduction (imftr) is then subtracted from Basic Federal Tax imbft to compute Federal Tax (imftax).

Federal Surtax

In 1985 a Federal Surtax was introduced as an additional tax based on Basic Federal Tax payable. In 1985, the surtax was calculated as a proportion (2.5%) of Basic Federal Tax exceeding $6,000 plus 2.5% of Basic Federal Tax exceeding $15,000. In 1986, this was extended to 1.5% of all Basic Federal Tax plus 5% of Basic Federal Tax exceeding $6,000 plus 5% of Basic Federal Tax exceeding $15,000. In 1987 this was simplified to a flat rate

(3%) on all Basic Federal Tax.

SPSM Implementation

The model allows for three surtax levels and three surtax rates. The total Federal Surtax (imfsur) is calculated as:

- a proportion (FSURR1) of Basic Federal Tax exceeding Surtax Level 1 (FSURL1), plus
- a proportion (FSURR2) of Basic Federal Tax exceeding Surtax Level 2 (FSURL2), plus
- a proportion (FSURR3) of Basic Federal Tax exceeding Surtax Level 3 (FSURL3), minus
- the amount of the addition Federal Foreign Tax Credit from 1986 forward (represented by variable (idfdsft).

The result is then added to Federal Taxes (imftax) (minus certain federal tax credits) to derive Federal Taxes Payable (imtxf).

Federal Taxes Payable

Federal Taxes Payable (imtxf) is defined as Federal Tax (imftax) plus the Federal Surtax (see above) minus the following tax credits:

- Federal Other Tax Credits (idfotc, Federal Tax Credits not otherwise modeled in the SPSD/M which is the sum of Federal Foreign Tax Credits, Share Purchase Tax Credit, Employment Tax Credit and Scientific Research Tax Credit,
- Federal Political Contribution Tax Credit (idfptc), and
- Federal Investment Tax Credit (iditc).

Alternate Minimum Tax

In 1986, a minimum tax on individuals was introduced with the intention of increasing the tax liability of those high income individuals who use the tax incentives provided by the current law to structure their affairs so as to pay little or no tax.

The Alternative Minimum Tax requires the calculation of an adjusted taxable income disallowing certain deductions, a list of which follows, which are added back to taxable income.

- Pension Income Deduction
- Interest and Dividend Income Deduction
- Disability Deduction Transferred from Dependant
- Education Deduction Transferred from Dependant
- Deductions Transferred from Spouse
- Employee Home Relocation Loan Deduction
- Stock Option and Shares Deduction
- Contribution to Deferred Income Plans (RPP and RRSP contributions)
- non-taxable portion of capital gains
- capital cost allowance on MURBS and Canadian Films

The grossed-up portion of taxable dividends and Allowable Business Investment Loss are

subtracted from taxable income.

The minimum tax is then calculated as a proportion of this adjusted taxable income exceeding the exemption level.

No details are available at the time of this writing on the implementation of the minimum tax after deductions are converted to tax credits as proposed in the June, 1987 White Paper on Tax Reform.

SPSM Implementation

If the Minimum Tax Rate (AMTTX) is not set to zero, the minimum tax algorithms are executed.

The first step recalculates an adjusted taxable income for minimum tax purposes (naitax) by adding the following items to imitax:

- RPP Contributions (idrpp)
- RRSP Contributions (idrrsp)
- Other Deductions from Total Income (idothdn, representing Capital Cost Allowances)
- Pension Income Deduction (imintdn)
- Interest Income Deduction (imintdn)
- Deductions Transferred from Spouse (imdedt)
- the non-taxable portion of Capital Gains (idicapg * (1 - CAPGIR))

The grossed-up portion of dividends (idiv (FDGUR - 1)), Business Investment Losses (idnclos), and the Minimum Tax Exemption (AMTEX) are subtracted from this value.

The Basic Minimum Tax (amtbft) is calculated as a proportion (AMTTX) of Adjusted Taxable Income (naitax).

The second step in this process adjusts the Basic Minimum Tax (amtbft) to account for the conversion of allowable deductions into tax credits. This requires subtracting the following tax credits from Basic Minimum Tax:

- Basic Tax Credit (imbtc)
- Spouse Tax Credit (immartxc)
- Age Tax Credit (imatxc)
- Tax Credit for Dependent Children (imctxcs)
- Education Tax Credit (imedtxc)
- Tuition Tax Credit (imtutxc)
- Medical Expense Tax Credit (immedatc)
- Charitable Donations Tax Credit (imchartc)
- Disability Tax Credit (imdisatc)
- Child Care Expense Tax Credit (imccetxc)
- CPP/QPP Contribution Tax Credit (imcppctc)
- UI Contribution Tax Credit (imuictc)

If the value of the Basic Minimum Tax (amtbft) exceeds Basic Federal Tax (imbft), Federal Tax Payable (imtxf) is recalculated as Basic Minimum Tax (amtbft) plus any federal surtaxes on amtbft . The federal surtax is calculated in the same manner as on Basic Federal Tax, previously described.

The database does not contain sufficient detail to accurately represent some of the deductions specified in the regulations concerning the calculation of the Minimum Tax. The Disability Deduction and Education Deduction transferred from dependents are not differentiable from those deductions claimed on behalf of the filer. The Employee Home Relocation Loan Deduction and Stock Option Shares Deduction are not represented on the database. The variable idothdn (Other Deduction's from Total Income) includes Capital Cost Allowances on MURBS and Canadian Films but it also contains amounts for moving expenses and alimony payments. It is difficult to estimate the impact of these inaccuracies except to say that they are likely small compared to the large amounts of income and other deductions for the high income persons for whom the Minimum Tax is intended.

Quebec Tax Abatement

The Quebec Tax Abatement is a refundable credit on federal taxes provided to Quebec residents in lieu of direct cost-sharing by the federal government under the federal-provincial fiscal arrangements. It reduces the federal income tax payable by Quebec residents and may provide a refund. The abatement amounts to 16.5% of Basic Federal Tax.

SPSM Implementation

If the filer resides in Quebec, the full Quebec Tax Abatement (qta) is calculated as a proportion (QTAP) of Basic Federal Tax (imbft). This is divided into two portions for accounting purposes:

- imqtaa is the Quebec Tax Abatement Applied to reduce federal taxes
- imqtar is the Quebec Tax Abatement Refunded

If the Quebec Tax abatement exceeds the Federal Tax payable then a refund is made for the balance of the abatement (imqtar) and the amount of Federal tax payable is reduced by the amount of the abatement. Users may wish to note that this abatement refund was an interesting side effect of the Federal Tax reduction in effect prior to 1986 (see notes in this section).

CROSS REFERENCE

Function	Description
INPUT PARAMETERS:	
AMTEX	Alternate minimum tax: exemption level
AMTTX	Alternate minimum tax rate
BXM	Basic personal exemption/amount

```
CAPGIR          Capital gains inclusion rate
EMPLOFLAG       Database variable(emplo) activation flag
FDGUR           Federal dividend gross-up rate
FDSFTFLAG       Database variable(fdsft) activation flag
FDTCR           Federal dividend tax credit rate
FNTCR           Federal non-refundable tax credit rate
FPTC            Federal political contribution table [total
donations,donation allowed]
FPTCBEN         Maximum federal political tax credit allowed
FSITCFLAG       Database variable(fsitc) activation flag
FSURL1          Federal surtax level 1
FSURL2          Federal surtax level 2
FSURL3          Federal surtax level 3
FSURR1          Federal surtax rate 1
FSURR2          Federal surtax rate 2
FSURR3          Federal surtax rate 3
FTRRL           Federal tax reduction reduction level
FTRRR           Federal tax reduction reduction rate
FTX             Federal tax table [taxable income,basic federal tax]
LABTXCFLAG      Database variable(labtxc) activation flag
MAXET           Maximum on transfer of education and tuition amount
MINCARFLAG      Database variable(mincar) activation flag
MXFTR           Maximum federal tax reduction
PARTLOFLAG      Database variable(partlo) activation flag
QTAP            Quebec tax abatement proportion of basic federal tax
XII2FLAG        Database variable(xii2) activation flag

INPUT VARIABLES:
cfin            First person in census family [pointer]
cfineld         Eldest person in census family [pointer]
cfinspo         Spouse of eldest [pointer]
cfnpers         Number of persons in census family
cfspoflg        Census family contains married couple
hdprov          Province
hhncf           Number of census families in household
idcfrh          Relationship to census family head
idcloss         Allowable other years capital loss (253)
idemplo         Employee home relocation loan dedn (248)
idexplor        Exploration and development expenses (224)
idfdfatc        Forward averaging tax credit (478)
idfdsft         Foreign tax credit applied to surtax (511)
idforinc        Net foreign income (508)
idfortx         Foreign tax paid (507)
idfsitc         Additional investment tax credit (518)
idicapg         Capital gains (actual)
ididiv          Dividend income (actual)
iditc           Federal investment tax credits (412)
idlabtxc        Labour funds tax credit (414)
idmincar        Minimum tax carryover (504)
idnclos         Allowable other years non-capital loss (252)
idothded        Other deductions from total income (232)
idpartlo        Limited partnership losses (251)
idpolcon        Federal political contributions (409)
idrpp           Registered pension plan contributions (207)
idrrsp          RRSP calculated amount (208)
idstkded        Stock option deduction (249)
idxii2          Part XII.2 tax credit (Trusts) (456)
```

```
imatxc          Age tax credit
imbtc           Basic personal tax credit
imcapgex        Modelled capital gains deduction (254)
imchartc        Charitable donations tax credit
imcppctc        CPP contributions tax credit
imcqppc         CPP/QPP contributions
imctxcs         Dependent children tax credits
imdedfn         All deductions from net income
imdedt          Deductions transfered from spouse
imdepni         Dependant's net income
imdisatc        Disability tax credit
imedtxc         Education allowance tax credit
imidivt         Dividend income (taxable)
iminet          Net income
imintdn         Interest income deduction allowed
imitax          Taxable income
immartxc        Married tax credit claimed
immedatc        Medical expenses allowed tax credit
impendn         Pension income deduction allowed
impentxc        Pension income tax credit
imtutxc         Tuition tax credit
imuic           UIC contributions
imuictc         UIC contributions tax credit

OUTPUT VARIABLES:
imamtdf         Difference due to minimum tax
imamtfg         Minimum tax flag
imatxcrt        Total tax credits applied
imbft           Basic federal tax
imctxcrt        Tax credits transferred from children
imedrcv         Education and tuition transfered from others
imedtrf         Education and tuition transfered to others
imfdtxc         Federal dividend tax credit
imfedtax        Federal tax before tax credits
imfortc         Federal other refundable tax credits
imfortxc        Federal foreign tax credit (509)
imfptc          Federal Political Contribution Tax Credit
imfsur          Federal surtax
imftr           Federal tax reduction
imftrt          Federal tax reduction transferred from spouse
imoftca         Other federal tax credits applied (416)
imqtaa          Quebec tax abatement (applied)
imqtar          Quebec tax abatement (refundable)
imstxcrt        Tax credits transfered from spouse
imtaxcr         Total tax credits
imttxcrt        Total tax credits transfered
imtxf           Federal income tax payable
```

SUMMARY

The txccea function calculates the value of the child care expense deduction. The calculation may be optionally converted to a tax credit basis rather than a deduction.

Description of tax measure

Child care expenses are amounts paid for child care services to allow the parent or "supporting person" to:

a) earn income from employment or self-employment, (this does not include a period of unemployment) or
a) take an occupational training course for which the person received an adult training allowance, or
a) carry on research or similar work for which the person received a grant.

A filer is eligible to claim child care expenses if:

a) there is no other supporting person
a) there is a supporting person with a higher net income (excluding child care expenses) than the filer
a) there is a supporting person with a net income lower than the filer but
    i. the filer and supporting person were separated for at least 3 months, or
    i. the supporting person was in full-time attendance at a designated educational institution, or
    i. the supporting person was infirm or in prison for at least 2 weeks.

A combination of limitations is applied to the amount claimable:

1. Two-thirds of earned income, and
1. a fixed amount per eligible child up to a fixed maximum is applied if the net income of the filer is less than that of a supporting person (conditions (a) and (b) above).

Under condition (c) above, i.e., the income of the supporting person is lower than that of the filer, the following additional limitation applies:

3. fixed weekly amount per child up to a maximum, multiplied by the number of weeks of separation, attendance at an educational institution, infirmity or imprisonment.

In 1982, the Child Care Expense Deduction was always taken by the mother of the child if she was present. Since then, the deduction or tax credit is normally allocated to the spouse with the lower net income, exclusive of the child care expense deduction, unless that person is separated, in school, infirm or in prison.

SPSM Implementation

The amount of Child Care Expenses Allowed is derived from income tax records during the

database creation process (see the *SPSD/M Database Creation Guide*). This value represents the amount allowed according to 1984 regulations. Though this amount may be grown or diminished by a fixed factor (GFCCEA), the rules described above cannot be easily altered in the current version of SPSM.

The parameter CCEROPT determines which spouse in a two-parent family claims the Child Care Expense Deduction. If CCEROPT is given a value of 1, the deduction is always taken by the mother. With a value of 2, the deduction is taken by the parent with the lower Net Income (iminet).

The condition for a temporarily absent, lower income spouse (condition c. above) is not checked.

On the database, only one spouse of a two-parent family will have been attributed a value for Child Care Expense Deduction Allowed. The assignment of this value is done before we have complete information about the relative net incomes and may therefore be given to an inappropriate person. The model uses the current value of Net Income (iminet) to re-allocate the deduction if necessary.

The parameter CCEOPT determines if child care expenses are treated as a deduction (CCEOPT=1) or as a tax credit (CCEOPT=2).

If child care expenses are treated as a deduction (CCEOPT=1), the amount is deducted from Net Income (iminet) and added to Total Deductions from Total Income (imdedft) for the appropriate spouse.

If child care expenses are treated as a tax credit, the amount of the tax credit (imccetxc) is calculated by taking a proportion (CCETR) of the allowable expenses (ccea) and applying it later in the function txcalc.

CROSS REFERENCE

Function	Description
INPUT PARAMETERS:	
BXM	Basic personal exemption/amount
CCEAEMPF	CCEA fraction of employment income (Limit `B')
CCEALIM	CCEA overall limit
CCEAOAGE	CCEA Maximum eligible age for oldest child
CCEAOLD	CCEA old child limit
CCEATFLG	CCEA eligible->claimable transformation activation flag
CCEATFR	CCEA eligible->claimable fraction
CCEATLL	CCEA eligible->claimable lower limit
CCEAYNG	CCEA young child limit
CCEROPT	Child care expense deduction recipient [1=mother,2=lower income]

```
CCESFLAG        CCE full-time student flag
CCEZOPT         CCE young kid optimization rules [1=use, 2=zero,
3=optimize]

INPUT VARIABLES:
cfinch          First child in census family [pointer]
cfineld         Eldest person in census family [pointer]
cfinspo         Spouse of eldest [pointer]
cfnkids         Number of children in census family
cfspoflg        Census family contains married couple
hhncf           Number of census families in household
idage           Age
idccet          Child care expenses associated with child
idccett         Child care expenses (Limit A, Form T778)
idestat         Educational status
idiemp          Wages & salaries
idisefm         Self-employed income - farming
idisenf         Self-employed income - non-farming
idsex           Sex
imccez          Is CCE zeroed?

OUTPUT VARIABLES:
imccea          Child care expenses allowed
imccec          Child care expenses claimed on behalf of child
imdedft         Deductions from total income
iminet          Net income
imninc          No income flag
```

txctc Compute child tax credit

SUMMARY

The federal Child Tax Credit provides benefits to help low and middle income families meet the costs of raising children under the age of 18. The txctc function calculates benefits from the federal Child Tax Credit (CTC) program based upon the number of children in a family and the net income of the family. The function has a parameterized option for including GIS/SPA and social assistance benefits in the definition of net income.

The level of benefits varies with the number of children.

Program Description

The federal Child Tax Credit provides benefits to help low and middle income families meet the costs of raising children under the age of 18. It was implemented in 1979 and is administered by Revenue Canada, Taxation, through the income tax system.

Any person who receives Family Allowances is eligible to apply for the Child Tax Credit.

The credit is available on behalf of a child for whom Family Allowances were paid for in the month of January following a given taxation year. An eligible person who voluntarily refrains from receiving Family Allowances may still claim the Child Tax Credit. The CTC must be applied for by filing an income tax return regardless of the income of the eligible parent or guardian. A foster parent in receipt of Special Allowances is not eligible for the CTC. Canadian residents living outside Canada, but paying Canadian taxes may apply for the credit.

The amount of the CTC is determined by the number of eligible children and the family's income. Family income is defined as the net income (as defined for income tax purposes) of both parents, whether married or not (provided they are living together), or the net income of a single parent. The net income of any other person who is claiming a personal exemption for a dependent child (whether or not the person lives with the claimant of the CTC) must also be included in family income. For families with taxable incomes the refundable credit to which they are entitled reduces the tax which must be paid; families whose taxes are less than the credit, or who pay no taxes at all receive a non-taxable lump sum payment.

The maximum annual credit is payable if net family annual income is less than a specified level of income called a benefit reduction level or turndown. Families with net incomes above this turndown are entitled to the maximum credit minus a specified percentage (reduction rate) of their net income in excess of the reduction point. The minimum CTC for eligible parent(s) is zero. In 1984 the maximum credit was $367, the reduction point was $26,330 and the reduction rate was 5%. So, for example, a family with two eligible children and a net income of $40,000 would receive a tax credit of $50.50 . The 1984 credit becomes zero for families with a net income at or above $41,010.

SPSM Implementation

The txctc function calculates the federal Child Tax Credit based on the number of children in a family and the net income of the family. Residency requirements are deemed to have been met in all cases. The function always allocates the Child Tax Credit to the mother unless one is not present in the nuclear family. The function only outputs a value for the federal child tax credit and this reflects the total value of the credit, whether used to reduce taxes, or received as a cash lump sum amount, or some mix of the two.

The txctc function operates at the nuclear family level. It first calculates a local variable for the family's net income by adding the eldest member's net income and that of their spouse (married or common-law) if present. The function optionally adds GIS, SPA, and Social Assistance benefits to family net income if the parameter CTCIFLAG is turned on. The maximum benefits for the family are then obtained by multiplying the number of children in the nuclear family by the maximum benefit per child (nfnkids * CTCPC). The maximum CTC is then reduced at the specified reduction rate (CTCRR) applied to family net income in excess of the CTC turndown (CTCTD). This reduction is performed using the taxbak1 function. Finally the federal Child Tax Credit is assigned to the to the mother if present and otherwise to the eldest member of the nuclear family.

When the FCBEIE flag is turned on, the Working Income Supplement has a different rate

according to the number of children in the household, FCBEIS1, FCBEIS2, FCBEIS3 and is also reduced at varying rates, FCBERR1, FCBERR2, FCBERR3. The enriched WIS is phased in starting at family incomes FCBECI and reaches its maximum at FCBEMX. The phase in rate is linear and depends again on the number of children in the family.

There was also a fix for the Quebec child tax benefits. The benefits (QCBC3) are now being assigned to the third and each additional child in a family.

Interpretation

Results obtained from the SPSM with respect to Child Tax Credit benefits differ from Revenue Canada administrative data. Overall the SPSM reports 101.9% more 1984 tax year benefits than does Revenue Canada for provincial Canada. However, the number of children for which the credit is paid is 99.6% of Revenue Canada's figures. One would expect the number of children on the SPSD to be low due to the non-coverage of persons residing on reservations and outside Canada. Thus there would seem to be a small deficit on the SPSD in the net income of families with eligible children.

Relation to Other SPSM Routines

The txctc function is called by drv. The function outputs one dollar value variable that is used in memo1 for reporting purposes.

CROSS REFERENCE

Function	Description
INPUT PARAMETERS:	
ACBC1	Alberta Child benefit per child aged 0 - 6
ACBC2	Alberta Child benefit per child aged 7 - 11
ACBC3	Alberta Child benefit per child aged 12- 15
ACBC4	Alberta Child benefit per child aged 16- 17
CTCERF	CTC child care expense reduction fraction
CTCIFLAG	Refundable tax credits social assistance income inclusion flag
CTCINC	CTC family income scaling factor
CTCOPT	Child tax credit option
CTCPC	Child tax credit per child
CTCREF	CTC post-reform rules flag
CTCRR	Child tax credit reduction rate
CTCSUP	CTC young child supplement
CTCTD	Family income child tax credit turndown
CTCTUR	CTC take up rate table [benefit,rate]
FCBBAS	Basic child benefit (per child)
FCBECI	Child benefits earning supplement cut-in level
FCBEIE	Flag for WIS dependent on number of children
FCBEIS	Child benefits earned income supplement

```
FCBEIS1         Enriched WIS for first child
FCBEIS2         Enriched WIS for second child
FCBEIS3         Enriched WIS for each additional child
FCBEMX          Earnings where WIS phase-in is at maximum
FCBERR          Child benefits earning supplement reduction rate
FCBERR1         WIS reduction rate for families with 1 child
FCBERR2         WIS reduction rate for families with 2 children
FCBERR3         WIS reduction rate for families with 3+ children
FCBESR          Child benefits earned income supplement rate
FCBETD          Child benefits earning supplement turndown level
FCBLRG          Supplement for 3rd and subsequent kids
FCBRR           Multi-children family income reduction rate
FCBRRS          Single-child family income reduction rate
FCBTD           Federal child benefits family income turndown
FCBYNG          Supplement for children under age 7
FCBYNGR         Child care expense reduction rate
PYINC           Deflator to calculate previous year income
QCBC1           Quebec Child benefit for 1st child
QCBC2           Quebec Child benefit for 2nd child
QCBC3           Quebec Child benefit for 3rd child
QCBCS           Quebec Child benefit supplement child aged 12- 17

INPUT VARIABLES:
cfinch          First child in census family [pointer]
cfineld         Eldest person in census family [pointer]
cfinspo         Spouse of eldest [pointer]
cfnchild        Number of children (including 18+)
cfspoflg        Census family contains married couple
hdprov          Province
hhncf           Number of census families in household
hhnnf           Number of nuclear families in household
idage           Age
idiemp          Wages & salaries
idisefm         Self-employed income - farming
idisenf         Self-employed income - non-farming
idrand          Random numbers [array]
idsex           Sex
imccec          Child care expenses claimed on behalf of child
imigis          GIS benefits
iminet          Net income
imisa           Social assistance (or replacement program)
imispa          Spouse's allowance
nfinch          First child in nuclear family [pointer]
nfineld         Eldest person in nuclear family [pointer]
nfinspo         Spouse of eldest [pointer]
nfnkids         Number of children in nuclear family
nfspoflg        Nuclear family contains married couple

OUTPUT VARIABLES:
imctc           Child tax credit
imfcben         Total Federal Child Benefits
imfcbenb        Total Federal Child Benefits Base
imfcbene        Total Federal Child Benefits Earning suppl
imninc          No income flag
```

SUMMARY

The refundable federal Sales Tax Credit provides benefits to help low income families offset the costs of federal sales taxes. The txfstc function calculates benefits from the federal Sales Tax Credit (STC) program based upon the number and type of persons in a family and the net income of the head and spouse. The function has a parameterized option for including GIS/SPA and social assistance benefits in the definition of net income.

Program Description

The refundable federal Sales Tax Credit provides benefits to help low income families offset the costs of federal sales taxes. It was implemented for the 1986 and subsequent tax years and is administered by Revenue Canada, Taxation, through the income tax system.

Upon application, through the filing of an income tax return, the federal sales tax credit is available to any individual who at the end of the year was married, had a child, or was over 18 years of age. Eligible individuals may claim the credit for themselves, their qualified relations, and one spouse. Individuals who are not subject to tax in Canada or who were confined to a prison or similar institution for a period of over six months in the year for which a claim is made may not claim the credit. A married couple may make only one claim.

Maximum family benefits are a function of the type and number of individuals in the family as well as the net income of the family. There are three individual credit maximums; one for the filer; one for a spouse with whom the filer resided at the end of the year; and one for any other person under the age of 18 at the end of the year who was a child of the individual or their spouse or was a person in respect of whom the individual or his spouse has claimed a personal deduction. Family net income is the net income, for tax purposes, of the head of the family and their spouse if present.

The maximum annual credit is payable if net family annual income is less than a specified level of income (called turndowns, exemptions, or benefit reduction levels). Families with net incomes above this reduction point are entitled to the maximum credit minus a specified percentage (reduction rate) of their net income in excess of the reduction point. The minimum STC is zero. In 1986 the maximum credit was $50 per adult and $25 per dependent child, the reduction point was $15,000 and the reduction rate was 5%. So, for example, a family with a spouse and two eligible children and a net income of $17,000 would receive a tax credit of $100.00 . (The 1986 credit becomes zero for families of this type with a net income at or above $18,000.)

SPSM Implementation

The txfstc function calculates the federal Sales Tax Credit based on the number, age, and type of persons in a family and the net income of the family. The function always allocates the Sales Tax Credit to the spouse with the higher net income in the nuclear family. The

function outputs values for the federal Sales Tax Credit and these reflect the total value of the credit, whether used to reduce taxes, or received as a cash lump sum amount, or some mix of the two.

The txfstc function operates at the nuclear family level. It first increments two local variables based on information on the eldest member of the nuclear family; one for the family's net income by adding the eldest member's net income; and one for the maximum family benefits by adding the maximum entitlement for a filer. The program next increments both local variables for the spouse (married or common-law) if present. The function optionally adds GIS, SPA, and Social Assistance benefits to family net income if the parameter CTCIFLAG is set to one. The maximum benefits for the family are incremented last by multiplying the number of children in the nuclear family by the maximum benefit per child (nfnkids * FSTCC). The maximum STC is then reduced at the specified reduction rate (FSTCR) applied to family net income in excess of the STC reduction point (FSTCL). This reduction is performed using the taxbak1 function. Finally the federal Sales Tax Credit is assigned to the to the mother if present and otherwise to the eldest member of the nuclear family.

When FSTCREF is set to 1, the federal sales tax credit is claimable at age 19. Parents may claim additional amounts for children aged 18 and younger. When the flag is set to 0, the credit is claimable at age 18 and only children aged 17 and younger can be claimed by their parents. This change required a shift from nuclear family loop to census family loop.

When calculating the GST credit, the income concept used is the previous year’s incomes. The GST credit for a given year, say 1992, would represent the amounts paid from July 1992 to July 1993.

Interpretation

Results obtained from the SPSM with respect to Sales Tax Credit benefits have no valid Revenue Canada administrative data with which to compare the results. In general, the SPSM should be slightly low due to certain coverage issues. Further analysis will be required to correctly estimate who in a married couple is claiming the benefit. Take-up issues may also be relevant.

Relation to Other SPSM Routines

The txfstc function is called by drv. The function outputs one variable that is used in memo1 for reporting purposes. The function makes use of (calls) the taxbak1 function.

CROSS REFERENCE

Function	Description
INPUT PARAMETERS:	
BXM	Basic personal exemption/amount
CTCIFLAG	Refundable tax credits social assistance income inclusion flag
FSTCC	Federal sales tax credit amount for dependant
FSTCF	Federal sales tax credit amount for filer
FSTCFLAG	Federal sales tax credit flag
FSTCL	Federal sales tax credit reduction level
FSTCR	Federal sales tax credit reduction rate
FSTCREF	Federal sales tax credit reform - age
FSTCS	Federal sales tax credit amount for spouse
GSTAC	GST additional credit amount
GSTAR	GST additional credit rate of net income
GSTFLAG	GST credit activation flag
PYINC	Deflator to calculate previous year income
INPUT VARIABLES:	
cfageeld	Age of eldest in census family
cfinch	First child in census family [pointer]
cfineld	Eldest person in census family [pointer]
cfinspo	Spouse of eldest [pointer]
cfnchild	Number of children (including 18+)
cfspoflg	Census family contains married couple
hhncf	Number of census families in household
idage	Age
imigis	GIS benefits
iminet	Net income
imisa	Social assistance (or replacement program)
imispa	Spouse's allowance
imitax	Taxable income
OUTPUT VARIABLES:	
imfstc	Federal sales tax credit
imninc	No income flag

txhhexp Compute and pro-rate household taxes, rent, etc.

SUMMARY

Description forthcoming

CROSS REFERENCE

Function	Description

```
INPUT PARAMETERS:
CTFAMSNA        FAMEX->SNA conceptual conversion factor [com]
CTFTOT          Federal total retail tax equivalent
CTPTOT          Provincial total retail tax equivalent
IMSHTOPT        Paid rent and property tax imputation option

INPUT VARIABLES:
fxio            I/O expenditure categories [array]
fxprtax         Property tax
fxtptax         Transfer of Property taxes
hdprov          Province
hhnin           Number of individuals in household
idcfrh          Relationship to census family head
idhhrh          Relationship to head of household
idproptx        Net property taxes paid (556)
idrentpd        Total rental payments (555)

OUTPUT VARIABLES:
improptx        Imputed property tax paid
imrentpd        Imputed rent paid
```

txhstr Compute family-related deductions or credits

SUMMARY

This function calculates exemptions or tax credits for dependents as well as performing transfers of deductions between spouses. The algorithms included in this function are:

- calculate and allocate Personal Exemptions or Tax Credits for Wholly Dependent Children
- calculate and allocate Spouse (or Married) Exemption or Tax Credit
- calculate Spouse (or Married) Equivalent Exemption or Tax Credit
- calculate Deductions Transferred from Spouse

Calculate and Allocate Personal Exemptions or Tax Credits for Wholly Dependent Children

Before 1988, filers with dependant children were eligible to claim a personal exemption based upon the age and net income of the child. The exemption was calculated as a fixed amount (adjusted annually) minus a proportion of the child's income exceeding the reduction level. The amounts varied with the age of the child. Children under 18 years of age were

treated differently from children 18 and over. This claim could be split between supporting parents or grand parents.

The June, 1987 White Paper on Tax Reform proposed the conversion of the exemption on behalf of children under 18 into a tax credit and the elimination of the exemption for children 18 and over.

SPSM Implementation

The parameter PEROPT controls whether personal exemptions or personal tax credits are calculated. If personal exemptions are calculated PEROPT=1, the amount of the exemption on behalf of each child under 18 is calculated by subtracting a proportion (YCXMR)of the child's Net Income (iminet) which exceeds the reduction level (YCXMT) from the Maximum Exemption (YCXM).

If the child is 18 or over but still under 21, or if the child is 21 or over and still in school (idestat=0), the amount of the exemption is calculated by subtracting a proportion (OCXMR) of the child's Net Income (iminet) which exceeds the reduction level (OCXMT) from the Maximum Exemption (OCXM).

The amounts for all children are accumulated in cdeds which may later be adjusted by the calculation of the Spouse Equivalent Exemption. If a spouse is present, the one with the higher Net Income (iminet) receives the full amount of the exemption for all dependent children (imcdeds) which is used to reduce Taxable Income (imitax) for that filer.

If personal tax credits are calculated (PEROPT=2), the amount of the tax credit on behalf of dependents under 18 is calculated by subtracting a proportion (YCTCR) of the child's Net Income (iminet) which exceeds the Reduction Level (YCTCT) from the Maximum Young Child Tax Credit (YCTC).

The amounts for all children are accumulated in ctxct which may later be adjusted by the calculation of the Spouse Equivalent Tax Credit. If a spouse is present, the one with the higher Net Income iminet receives the full amount of the tax credit for all dependent children (imctxcs) which is used to reduce Basic Federal Tax imbft in the function txcalc.

There is no tax credit for dependent children 18 and over. The model has no provision for a tax credit for infirm dependents aged 18 and over.

The model does not partition exemptions for wholly dependant children between spouses as is allowed in tax regulations. If it were partitioned, certain families would pay slightly lower taxes.

Married Exemption or Spouse Tax Credit

Persons legally married during the taxation year are eligible to claim a Married Exemption or Spouse Tax Credit. Before 1988, the Married Exemption amounted to a fixed value reduced by a proportion of the spouse's net income exceeding a specified level. Net income for this purpose includes the spouse's GIS/SPA benefits.

The June, 1987 White Paper on Tax Reform proposed the conversion of this exemption into a non-refundable tax credit. The tax credit amounts to a fixed amount reduced by a proportion of the spouse's net income exceeding a specified level.

SPSM Implementation

The parameter PEROPT controls whether the Married Exemption or Spouse Tax Credit is calculated. IF the Married Exemption is calculated (PEROPT=1) the Modeled Married Exemption (immarex) amounts to the Maximum Married Exemption (MXM) reduced by a proportion (MXMR) of the spouse's Net Income (iminet) exceeding the reduction level (MXMT). Note that (iminet) does not include spouse's GIS/SPA benefits. This is calculated only for the spouse with the higher Net Income. The Married Exemption (immarex) is added to Total Personal Exemptions (impex) which is subsequently used to reduce the Taxable Income (imitax) of the claiming spouse.

If the Spouse Tax Credit is calculated, the credit (immartxc) amounts to a fixed value (STC)reduced by a proportion (STCR) of the spouse's Net Income (iminet) exceeding the reduction level (STCT). This is calculated only for the spouse with the higher Net Income.

The Spouse Tax Credit (immartxc) is used to reduce Basic Federal Tax in the function txcalc.

Although the regulations allow special considerations for persons who changed marital status during the taxation year, they are not implemented in the model.

Married Equivalent Exemption or Spouse Tax Credit

Filers who are single, divorced, separated or widowed and supported a relative related by blood, marriage or adoption are eligible to claim that relative for the Married Equivalent Exemption or, post-reform a Spouse Tax Credit.

Before 1988, the Married Equivalent Exemption amounted to a fixed value reduced by a proportion of the dependent's net income exceeding a reduction level. The June, 1987 White Paper on Tax Reform proposed the conversion of this exemption into a tax credit amounting to a fixed value reduced by a proportion of the relative's net income exceeding a reduction level.

SPSM Implementation

The parameter PEROPT controls whether a Married Equivalent Exemption or Spouse Equivalent Tax Credit is calculated.

If PEROPT is set to 1, the Married Equivalent Exemption is calculated. The SPSM only calculates the exemption on behalf of dependent children, not other relatives who may be eligible. The model attempts to make the claim on behalf of the dependant for whom a claim will benefit the filer most. The first choice for the exemption is a dependant who is not claimable for the Wholly Dependant Child Exemption, i.e., one who is over 21, is not attending school full-time, and has a Net Income (iminet) less than the Basic Personal Exemption (BXM). If there is no such dependant, the one with the lowest Net Income

(iminet) is chosen.

The exemption (immarex) is calculated as a fixed amount (EXM) reduced by a proportion (MXMR) of the dependant's Net Income (iminet) exceeding the Reduction Level (MXMT). If the exemption is calculated on behalf of a dependant who has already been accumulated into the total exemption for Wholly Dependant Children (cdeds), the amount claimed for that dependant (cdedt) is subtracted from cdeds, and the number of children claimed (chclm) is reduced by one.

The Married Equivalent Exemption (immarex) is added to Total Personal Exemptions (impex) and subtracted from Taxable Income imitax .

If PEROPT is set to 2, the Spouse Equivalent Tax Credit (immartxc) is calculated. The SPSM calculates the credit on behalf of dependent children, not other relatives who may be eligible. The algorithm parallels the calculation of the Married Equivalent Exemption. If a non-claimable dependant is present, he or she is chosen to be claimed for the credit. If there is no such dependant, then the one with the lowest Net Income (iminet) is claimed.

The credit is calculated as a fixed amount (ESTC) reduced by a proportion (STCR) of the dependant's Net Income (iminet) exceeding the reduction level (STCT). If the credit is being claimed on behalf of a dependant who is also eligible for the Wholly Dependent Child Tax Credit, the amount claimed for that dependant (ctxcm) is subtracted from the total Wholly Dependent Child Tax Credit (ctxcs) and the total number of children claimed (chclm) is reduced by one.

The Spouse Equivalent Tax Credit is added to Total Nontransferable Tax Credits (imtaxcr) which is subtracted from Basic Federal Tax (imbft) in the function txcalc.

Calculate Deductions Transferred from Spouse

Before 1988, certain deductions not required to reduce a filer's net income to zero could be transferred to the filer's spouse. The following deductions were transferable:

- Age Exemption
- Interest and Dividend Income Deduction
- Pension Income Deduction
- Disability Deduction
- Education Deduction

The total amount of deductions transferred from the spouse is the amount not required to reduce the spouse's taxable income to zero. There is also a limit on the amount of combined Interest and Dividend Income Deduction and Pension Income Deduction transferred which amounts to the unused portion of the Married Exemption, i.e., if the full Married Exemption was claimed then no portion of these two deductions may be transferred.

The June, 1987 White Paper on Tax Reform proposed the conversion of some of these deductions into tax credits, the elimination of the Interest and Dividend Income Deduction and the addition of the Tuition Tax Credit as a transferable credit. Since the algorithms for

performing the transfer of tax credits are in the function txcalc, they are documented in the section which describes that function.

SPSM Implementation

The parameter PEROPT controls whether deductions or tax credits are calculated. If PEROPT is 1, then transferable deductions are calculated in the function txhstr. If PEROPT is 2, then transferable deductions are not calculated. The function txcalc calculates the transfer of tax credits independent of the value of PEROPT.

If transferable deductions are calculated, then for the spouse with the lower Net Income (iminet), potentially transferable deductions (dedt)are calculated as the sum of:

- Age Exemption (imaxm),
- Disability Deduction (imdisex),
- Education Deduction (imeduc), and the lesser of:
  a) total Pension Income Deduction (impendn) and Interest Income Deduction (imintdn), and
  a) the unused portion of the Married Exemption (MXM - marrex).

The amount transferred is limited to the amount not required to reduce the spouse's taxable income to zero by subtracting from the above total the amount by which the spouse's Net Income (iminet) exceeds the Basic Personal Exemption (BXM).

The amount transferred from the spouse (dedt) is subtracted from the filer's Taxable Income (imitax) and added to Total Deductions from Net Income (imdedfn). The spouse's Taxable Income and deductions are not adjusted since Taxable Income is zero. The amounts recorded for the individual deductions (e.g., imaxm, impendn)are not adjusted to reflect the transfer.

CROSS REFERENCE

Function	Description
INPUT PARAMETERS:	
BXM	Basic personal exemption/amount
DEPNIFG	Include SA, etc. in dependant's net income
EMXM	Married equivalent exemption/amount
EMXMT	Married equivalent exemption/amount turndown level
FNTCR	Federal non-refundable tax credit rate
MXM	Married exemption/amount
MXMT	Married exemption/amount turndown level
OCXM	Exemption for old dependent child
OCXMR	Exemption reduction rate for old dependent child
OCXMT	Exemption turndown for old dependent child
PEROPT	Personal exemption/credit option [1=deduction,2=credit]
YCXM	Dependent child exemption
YCXM1	Dependent child amount (1st child)

```
YCXM2          Dependent child amount (2nd child)
YCXM3          Dependent child amount (3rd ,etc.)
YCXMR          Dependent child exemption reduction rate
YCXMT          Dependent child exemption/amount turndown level

INPUT VARIABLES:
cfinch         First child in census family [pointer]
cfineld        Eldest person in census family [pointer]
cfinspo        Spouse of eldest [pointer]
cfnchild       Number of children (including 18+)
cfspoflg       Census family contains married couple
hhncf          Number of census families in household
hhnin          Number of individuals in household
idage          Age
idestat        Educational status
imaxm          Age personal exemption
imdisex        Disability exemption
imeduc         Education allowance for student (322)
imigis         GIS benefits
iminet         Net income
imintdn        Interest income deduction allowed
imisa          Social assistance (or replacement program)
imispa         Spouse's allowance
impendn        Pension income deduction allowed

OUTPUT VARIABLES:
imcchc         Child's non-refundable credit
imcdeds        Dependent children deductions
imcemc         Child's equivalent to married credit
imchclm        Number of dependent children claimed
imctxcs        Dependent children tax credits
imdedfn        All deductions from net income
imdedt         Deductions transfered from spouse
imdepni        Dependant's net income
imitax         Taxable income
immarex        Married exemption claimed
immartxc       Married tax credit claimed
impex          All personal exemptions and deductions
```

txinet Compute net income

SUMMARY

The txinet function contains several algorithms which are required to calculate net income. The algorithms calculate the following specific tax measures which are discussed in order in terms of the description of the tax measure and its SPSM implementation.

- Employment Expense Deduction
- Other Allowable Employment Expenses
- Calculate Taxable Dividends

- Calculate Taxable Capital Gains
- Calculate Total Income
- CPP/QPP Contributions (Deduction or Tax Credit)
- Unemployment Insurance Contributions (Deduction or Tax Credit)
- Tuition Fees (Deduction or Tax Credit)
- Calculate all deductions from total income
- Assign Taxable portion of Family Allowance to head or spouse
- Calculate Net Income

Program Description

Employment Expense Deduction

This is used to reduce employment income before it is added in to total income. The June 1987 White Paper on Tax Reform proposed the elimination of this deduction beginning with taxation year 1988.

The flag EAOPT controls whether the Employment Expense Deduction is calculated. With a value of 1, imdedea is calculated. If EAOPT is set to 2, imdedea is set to zero.

The Employment Expense Deduction (imdedea) is a deduction from Total Employment Earnings (idiemp) It is calculated as a proportion (EAPRP) of Total Employment Earnings up to a specified maximum (EAMAX).

Other Allowable Employment Expenses

Certain special employment expenses not claimable elsewhere are allowed.

According to the 1984 definition, these expenses include:

- employee's expenses for travel, office and wages to assistants,
- commission sales employees may claim certain expenses paid to earn their income,
- transport employees may deduct the cost of meals and lodging while away from home, and
- power saw operators may claim expenses incurred in operating the power saw.

This is a special deduction from employment income and is not available to most employees.SPSM Implementation

The value for Other Allowable Employment Expenses (idalexp) already exists on the database. This value is derived from actual taxation statistics. For more details, please see the *SPSD/M Database Creation Guide*. This value is multiplied by the parameter ALEXPP (Proportion of Other Allowable Expenses to Use as a Deduction) to obtain imalexp, the modeled amount for Other Allowable Expenses.

Calculate Taxable Capital Gains

Capital Gains arise when an individual sells a property for more than it originally cost. If a

property is sold for less than it cost, a capital loss may be claimable.

Only a portion of Capital Gains received are considered taxable. Similarly only a portion of capital losses may be claimed as a loss. The value of idicapg represents the actual amount of the Capital Gain or Loss Allowed. Losses, in 1984, were limited to $2,000. This represents the lower limit of the variable idicapg. Modeled Taxable Capital Gains or Losses imicapgt are calculated by multiplying idicapg by the Capital Gains Inclusion Rate (CAPGIR).

Calculate Taxable Dividends

To avoid double taxation of dividends earned in Canadian business, the dividends from taxable Canadian corporations are treated differently from other sources of income. Before taxation, these dividends are "grossed-up" or increased to an amount which approximates the underlying corporate tax already paid on these earnings. A Dividend Tax Credit is paid based on the grossed-up amount and approximated the corporate taxes already paid.

The gross-up tax credit system ensures that income earned by Canadian corporations and then distributed in the form of dividends bears the same amount of total tax as if the income were earned directly by the shareholders.

SPSM Implementation

Total Dividends Received is represented on the database by the variable ididiv. The taxable amount (imidivt) which is added to total income is calculated by multiplying ididiv by the Federal Dividend Gross-up Rate (FDGUR).

Calculation of Total Income

At this point, the SPSM is able to calculate a first approximation of total income for tax purposes. This is not a final value since Family Allowances cannot be allocated to the mother or father until the Net Income of both is known. This temporary value of Total Income (itot) is the sum of:

idiemp:	Earnings From Employment
idisenf:	Self-employment Earnings (Non-farm), optionally scaled by the parameter FACTISENF
idisefm:	Self-employment Earnings (Farm)
idiroom:	Net Income From Roomers and Boarders
idiint:	Interest Income
idioinv:	Other Investment Income
idicqp:	CPP/QPP Benefits Received
iditogv:	Other Taxable Government Income
idipens:	Pension Income
iditoth:	Other Taxable Income
imiuib:	Modeled Unemployment Insurance Benefits Received
imiotg:	Modeled New Taxable Demogrants
imioas:	Modeled OAS Benefits
imidivt:	Modeled Taxable Amount of Dividends

imicapgt: Modeled Taxable Capital Gains and Losses

From this total, the two deductions from employment income are subtracted:

- imalexp: Modeled Other Allowable Employment Expenses
- imdedea: Modeled Employment Allowance

Calculate CPP/QPP Contribution Deduction or Tax Credit

All Canadians aged 18 to 64 and in the labour force are covered by either the Canada Pension Plan (CPP) or the Quebec Pension Plan (QPP). The pension plans provide retirement benefits as well as survivor benefits for a widow or dependant when the contributor dies prematurely, a death benefit and disability benefits. The plans are publicly funded, based on contributions from all employed persons aged 18 to 70 with pensionable earnings.

Contributions to the Canada and Quebec Pension Plans are based on employment income and are usually made through payroll deductions. Self-employed persons make their contribution through the tax system, the amount of the contribution is added to federal taxes payable.

The amount contributed is not subject to taxation and is therefore either deducted from total income or treated as a tax credit.

In most cases, an employee and his or her employer will contribute the same amount to the employee's pension plan. Self-employed persons contribute a twice the rate of employees.

Although employees have their CPP/QPP contribution deducted from their paycheck, refunds for overpayment are made through the personal income tax system.

SPSM Implementation

CPP/QPP Contributions are calculated separately on employment and self-employment earnings. Employment earnings subject to contribution are calculated by subtracting the amount of exemptable earnings (CPPXM) from Earnings from Employment (idiemp). This amount cannot exceed the Maximum Earnings Subject to Contribution (YMPE minus CPPXM). Earnings Subject to Contribution are then multiplied by the CPP/QPP contribution rate (WSCF)to derive the amount of the contribution (wscon).

Contributions from self-employment earnings (secon) is a proportion (SECF) of Earnings from Employment (idiemp) plus Earnings from Self-employment (idisenf + idisefm) that are in excess of the Annual Exemption Level (CPPXM) and less than the year's Maximum Pensionable Earnings Level, less a multiple (WSCM) of contributions made on Earnings from Employment (wscon). WSCM is the ratio of the contribution rate on earnings from self-employment to the rate on earnings from employment.

The total CPP/QPP Contribution is the sum of the Contribution Payable on Earnings from Employment (wscon) plus the Contribution Payable on Earnings from Self-employment (secon).

There is no information in the database concerning the actual amount deducted through payroll deductions; therefore, refunds for overpayment cannot be calculated.

The parameter CPPOPT determines whether CPP/QPP Contributions are treated as deductions from Total Income (CPPOPT=1)or as a non-refundable tax credit (CPPOPT=2). If they are treated as deductions from total income, the value imcqppc is added to Total Deductions from Total Income imdedft. If the contributions are treated as tax credits, the tax

credit (imcppctc) is calculated as a proportion (CPPCTR) of the total contributions (imcqppc) The tax credit is applied in the function txcalc.

Unemployment Insurance Contributions

Unemployment Insurance is intended to provide short-term financial support to the unemployed. It also provides benefits for those suffering from extended sickness, for women leaving the labour force temporarily because of pregnancy and childbirth, and supplementary benefits to unemployed fishermen and to persons undertaking manpower training courses. The program is given its mandate by the Unemployment Insurance Act (1971). The act covers nearly all members of the labour force except self-employed persons and those who earn less than the minimum insurable earnings. The program is funded by employee and employer contributions as well as additional revenue from the consolidated revenue fund.

Contributions are calculated as a proportion of weekly earnings. Only earnings above the minimum insurable earnings and less than the maximum insurable earnings are subject to contribution.

Unemployment Insurance premiums are deducted from the employee's paycheck by the employer. Reimbursements for overpayment are made through the tax system. The amount contributed is not subject to tax. Before 1988, UI contributions were deducted from total income. The June 1987 White Paper on Tax Reform proposed the conversion of this deduction into a non-refundable tax credit.

Two major Employment Insurance Reforms were added, the difference in contributions, and the benefits repayable.

SPSM Implementation

The database contains no detail on an individual's weekly distribution of earnings throughout the year. Weekly earnings are estimated by dividing the annual Earnings from Employment (idiemp) by the Number of Weeks Worked (idlyww). This assumes that the earnings were evenly distributed throughout the year. It also assumes that the earner worked at least 20 hours during each week.

If the average weekly earnings thus calculated are less that the Minimum Weekly Insurable Earnings MNWEL, the contribution is zero. Otherwise, the annual UI Contribution (imuic) are calculated as a proportion (UIPF) of average weekly earnings not exceeding the Maximum Weekly Earnings Subject to Contribution (MXWEL), multiplied by the number of weeks worked.

The value of the parameter UICOPT determines whether UI contributions are treated as a deduction from total income (UICOPT=1)or as a non-refundable tax credit (UICOPT=2). When treated as a deduction from total income, the UI Contributions (imuic) are added to the value of Total Deductions from Total Income (imdedft).

If UI contributions are to be treated as a tax credit (UICOPT=2), the UI Contribution Tax Credit (imuictc) is calculated as a proportion (UICTR) of the contributions. This tax credit is

later applied to reduce Basic Federal Tax in the function txcalc.

When Employment Insurance is activated (UIEIOPT = 2), then the EI contributions (imuic) are calculated using the UI contribution rate on earnings (UIPF) with no weekly maximums and no exemptions for low income. The EI contribution refund (imuicrf) is then calculated and subtracted from the contributions.

The method of calculating UI/EI benefit recovery (imuibr) is also changed when UIEIOPT is activated. It now depends on the amount of previous weeks of EI received. If employment insurance benefits (imiuib) have been received and net income is in excess of: (a) UIBRA for persons with previous EI receipt, or (b) UIBRANR for persons with little previous benefits or for persons not on regular EI claims; UIEIRPR is applied to the lower of (a) total EI benefits and (b) the excess net income up to a maximum percent of their total benefits (UIEIBRP), to calculate the repayment. See UIEIRPR, UIBRANR, UIEIBRP, UIBRA, and UIEINRT for more details.

Tuition Fees

Only the student may claim tuition fees paid to an educational institution as a deduction from total income. The June 1987 White Paper on Tax Reform proposed the conversion of this deduction into a tax credit which may be transferred to a spouse or supporting parent. The White Paper proposed a maximum of $600 on the amount of combined Tuition and Education Tax Credit transferred.

SPSM Implementation

A value for Tuition Deduction Allowed in the base year (idtuitn) exists on the database. This value is imputed from income tax records (see the *SPSD/M Database Creation Guide*). The parameter TUITOPT determines whether tuition fees are considered a deduction from total income (TUITOPT=1) or as a tax credit (TUITOPT=2).

If tuition fees are treated as a deduction, the database value (idtuitn) is simply added to Total Deductions from Total Income (imdedft). If they are treated as tax credits, idtuitn is multiplied by the Tuition Fee Tax Credit Rate TUTCR and the result (imtutxc) is later applied as a tax credit in the function txcalc.

Assign Taxable Family Allowance

For tax purposes, Family Allowances are attributed to the person who claims a personal exemption (or post-reform, a tax credit) for the child. The model assumes that the exemptions are allocated to the spouse with the higher net income (iminet, excluding FA) if present. This is the spouse who would benefit most from claiming the children and, therefore, this is the one who also must claim Taxable Family Allowances.

Calculate Net Income

Net Income (iminet) is calculated as Total Income (imitot) minus All Deductions from Total Income (imdedft). imdedft is the sum of:

idrpp:	Registered Pension Plan Contributions
idrrsp:	Registered Retirement Savings Plan Contributions
iddues:	Union and Professional Dues
idiloss:	Allowable Business Investment Loss
idothded:	Other Deductions from Total Income (includes Moving Expenses, Alimony Paid, Repayment of Income Amounts, Legal and Accounting Fees, Petroleum Exploration Ventures, Capital Cost Allowance on Canadian Motion Picture Films and Video Tapes)
idcarry:	Carrying Charges (interest on money borrowed to earn investment income)
imcqppc:	optionally, CPP/QPP Contributions
imuic:	optionally, UI Contributions
idtuitn:	optionally, Tuition Fees
imccea:	optionally, Child Care Expense Deduction Allowed (calculated separately in function txccea)

CROSS REFERENCE

Function	Description
INPUT PARAMETERS:	
ALEXPP	Proportion of other allowable employment expenses to use as deduction
CAPGIR	Capital gains inclusion rate
CPPOPT	CPP/QPP contribution deduction/credit option [1=deduction,2=credit]
CPPXM	CPP/QPP exemptible earnings
EAMAX	Maximum employment expenses
EAOPT	Employment expense calculation option [1=deduction,2=none]
EAPRP	Employment expenses allowed - percent
FACTISENF	Scale-up factor for non-farm self-employment income
FARR	Family allowance repayment rate
FATBPI	Family allowance take-back phase in
FATD	Family allowance turndown income
FDGUR	Federal dividend gross-up rate
FNTCR	Federal non-refundable tax credit rate
NETOASFLG	Net the clawback from Old Age Security
OASRR	OAS reduction rate
OASTBPI	OAS take-back phase in
OASTD	OAS turndown income
REPNETFLAG	Social program repayments reduce net income flag
SECF	CPP/QPP contribution rate on self-employment earnings
TUITOPT	Tuition deduction/credit option [1=deduction,2=credit]
UIBRA	UI repayment base amount (UI and EI)
UIBRANR	EI repayment base amount for non-repeaters (EI only)

```
UIBRP           UI benefit recovery portion (UI only)
UICOPT          UI contributions deduction/credit option
[1=deduction,2=credit]
UIEIBRP         Maximum clawback under EI reform [Past Wks ben][Rate] (EI
only)
UIEINRT         UI EI Non repeater level for higher clawback turndown (EI
only)
UIEIOPT         UI Employment Insurance reform option [1=UI, 2=EI Dec'95]
UIEIREF         EI contribution refund cut-in (EI only)
UIEIRPR         UI EI benefit clawback rate (EI only)
UIERNMAX        Maximum insurable earnings (UI and EI)
UIMINPCT        Exemption limit (percent of maximum insurable earnings) (UI
only)
UIPF            UI contribution rate on earnings (UI and EI)
WSCF            CPP/QPP contribution rate on employment earnings
WSCM            Ratio of self-employed to employed contribution fraction
YMPE            CPP/QPP maximum pensionable earnings

INPUT VARIABLES:
hhnin           Number of individuals in household
hhnnf           Number of nuclear families in household
idalexp         Other allowable employment expenses (229)
idcarry         Carrying charges (221)
iddalimo        Alimony paid (220)
iddues          Union and professional dues (212)
idexplor        Exploration and development expenses (224)
idicapg         Capital gains (actual)
idicqp          CPP/QPP income (114)
ididiv          Dividend income (actual)
idiemp          Wages & salaries
idiint          Interest income (121)
idiloss         Business investment losses (217)
idioinv         Other investment income with net rental
idipens         Pension income (115)
idiroom         Net income from roomers and boarders (126)
idisefm         Self-employed income - farming
idisenf         Self-employed income - non-farming
iditogv         Other government income (taxable)
iditoth         Other non-government income (taxable)
idlyww          Weeks worked
idmovexp        Imputed moving expenses (219)
idothded        Other deductions from total income (232)
idrpp           Registered pension plan contributions (207)
idrrsp          RRSP calculated amount (208)
idtuitn         Tuition fees (320)
imiotg          Other taxable demogrants
imiuib          Unemployment Insurance\Employment Insurance benefits
nfineld         Eldest person in nuclear family [pointer]
nfinspo         Spouse of eldest [pointer]
nfnkids         Number of children in nuclear family
nfspoflg        Nuclear family contains married couple
ubcalpd         Benefits paid in calendar year
ubeiwbp         Weeks of past EI benefits
ucbtyp          Claim type
ucstat          Claim status flag

OUTPUT VARIABLES:
```

```
imalexp         Allowable employment expenses
imcppctc        CPP contributions tax credit
imcqppc         CPP/QPP contributions
imdedea         Employment allowance
imdedft         Deductions from total income
imfar           Family allowance recovery
imicapgt        Capital gains (taxable)
imidivt         Dividend income (taxable)
iminet          Net income
imioas          OAS benefits
imitot          Total income
imnfach         Number of family allowance children claimed
imninc          No income flag
imoasr          OAS recovery
imqtfa          Quebec taxable family allowances
imrepay         Social Benefits Repayments
imtfa           Taxable family allowances
imtutxc         Tuition tax credit
imuibr          UI benefit recovery
imuic           UIC contributions
imuicrf         UI EI contribution refund
imuictc         UIC contributions tax credit
```

txitax Compute taxable income and individual credits

SUMMARY

The process of computing taxable income is divided into two separate routines. Exemptions, deductions and tax credits which are not dependent upon information from other members of the family (e.g., the Basic Personal Exemption or Basic Personal Tax Credit) are collected together in txitax. Algorithms which require information on the age, income or deductions of a spouse or dependant are in txhstr. txitax calculates a provisional value for taxable income (imitax) which may be further adjusted by txhstr.

The algorithms contained in txitax are:

- Basic Personal Exemption or Tax Credit
- Age Exemption or Tax Credit
- Pension Income Deduction
- Standard Deduction, Medical Expense Deduction or Tax Credit, Charitable Donations Deduction or Tax Credit
- Disability Deduction or Tax Credit
- Education Deduction or Tax Credit
- Capital Gains Deduction
- UI Benefit Repayment Payable
- Family Allowance and OAS Repayment Payable (optional)

Two deductions which are not included here are the Employee Home Relocation Deduction

and the Stock Option and Shares Deduction. Forward averaging is also not implemented because of the filer's previous years tax information is not available.

Basic Personal Exemption or Tax Credit

For taxation years before 1988, all persons living in Canada claimed the Basic Personal Exemption which was adjusted annually. The June 1987 White Paper on Tax Reform proposed the conversion of this exemption (and many deductions), into non-refundable tax credits. Under this proposed tax reform, all Canadians would claim the Basic Personal Tax Credit.

The model allows the user to choose algorithms for either personal exemptions or personal tax credits by assigning the appropriate value to the parameter PEROPT. If PEROPT is set to 1, algorithms for the Basic Personal Exemption are executed (and others, see the description of PEROPT in the *SPSD/M Parameter Guide*). If PEROPT is assigned a value of 2, the algorithm for the Basic Personal Tax Credit is executed.

If the Basic Personal Exemption is calculated (PEROPT=1), the value assigned to the parameter BXM (Basic Personal Exemption) is added in to the variable imexm which accumulates personal exemptions as they are calculated.

If the Basic Personal Tax Credit is calculated (PEROPT=2), the value assigned to the parameter BTC (Basic Personal Tax Credit) is assigned to the variable imbtc (Modeled Basic Personal Tax Credit) which is applied to reduce Basic Federal Tax in the function txcalc.

Age Exemption or Tax Credit

For taxation years before 1988, all Canadians who were 65 years of age or older on December 31st of the taxation year were eligible to claim the Age Exemption, the value of which was adjusted annually. The June 1987 White Paper on Tax Reform proposed the conversion of this exemption into a non-refundable tax credit. Under this tax reform, all Canadians who were 65 years of age or older on December 31st of the taxation year would be eligible to claim the Age Tax Credit.

The parameter AOPT is used to control whether the Age Exemption or Age Tax Credit is computed. If the Age Exemption is executed (AOPT=1), imaxm (Modeled Age Exemption) takes on the value assigned to the parameter AXM for all persons aged 65 and over. The value is also added to the variable imexm which accumulates personal exemption values as they are calculated. The value assigned to imaxm is used to calculate taxable income (imitax) by way of the variables imexm and impex (Total Personal Exemptions).

Since the Age Exemption is transferable between spouses, the value assigned to impex and imitax may be adjusted to reflect this transfer by the function txhstr. If the filer transfers the unused proportion of the Age Exemption the value of imaxm is not adjusted.

If the Age Tax Credit is calculated (AOPT=2), imatxc (Modeled Age Tax Credit) receives the value assigned to the parameter ATC. The function txcalc performs any applicable transfer of the tax credit from the spouse and applies the tax credit to reduce Basic Federal

Tax.

The variable idage on the database, represents the age, in years, of the filer in April of 1984 (see the description of idage in the *SPSD/M Variable Guide*). This implies that those who turn 65 between May and December 1984 are not considered 65 years of age and therefore do not receive the Age Exemption or Tax Credit.

Pension Income Deduction or Tax Credit

Certain pension income from a pension plan or upon the death of a spouse qualifies for a Pension Income Deduction of Tax Credit. Before 1988, the deduction amounted to the lesser of the maximum deduction (fixed at $1,000) and eligible income. Any amount of this deduction not required to reduce taxable income to zero is transferable to the spouse.

The June, 1987 White Paper on Tax Reform proposed the conversion of this deduction into a tax credit amounting to a proportion of eligible income up to a maximum of $170. This tax credit would also be transferable.

SPSM Implementation

The parameter YPNOPT controls whether the algorithms for Pension Income Deduction or Pension Tax Credit are executed. If the Pension Income Deduction is calculated (YPNOPT=1), impendn (Modeled Pension Income Deduction) is calculated as the minimum of:

a) qualified pension income (idipens), and
a) the Maximum Allowable Deduction (YPNDL)

Although the value of impendn is added to Total Deductions from Net Income (imdedfn) and thereby subtracted from net income (iminet), the values for imdedfn and iminet may be subsequently adjusted if any portion of this deduction is transferred to the spouse by the function txhstr. The value for impendn is not adjusted to reflect any transfers.

If the Pension Income Tax Credit is calculated (YPNOPT=2), impentxc (Modeled Pension Income Tax Credit) is assigned the minimum of:

a) qualified pension income (idipens) times the Pension Income Tax Credit Rate (YPNTR), and
a) the Maximum Allowable Tax Credit (YPNTL)

Any portion of the Pension Income Tax Credit not required to reduce a filer's Basic Federal Tax to zero is transferable to the spouse. The transfer is calculated in the function txcalc.

Interest and Dividend Income Deduction

In taxation years before 1988, interest income from Canadian sources and dividends from taxable Canadian corporations were eligible for an Interest and Dividend Income Deduction. In 1984 and before income from capital gains were also eligible.

The deduction amounted to the lesser of a fixed amount ($1,000) and total eligible income.

Any amount of the deduction not required to reduce taxable income to zero was transferable to the spouse.

The June, 1987 White Paper on Tax Reform proposed the elimination of this deduction beginning in taxation year 1988.

SPSM Implementation

Eligible income is calculated as the sum of:

idiint:	Interest Income
imidivt:	Modeled Taxable Dividends
imicapgt:	Modeled taxable capital gains (optional)

The parameter GCIFLAG controls whether taxable capital gains are included in the total of eligible income.

Carrying Charges (idcarry) are subtracted from this total. The Interest and Income Deduction (imintdn) is then calculated as the lesser of this eligible income and the Maximum Interest Income Deduction (YINDL).

The value of imintdn is added to Total Deductions from Net Income (imdedfn) which is subsequently subtracted from Net Income (iminet). Since this deduction is transferable between spouses, the function txhstr may later adjust the values of imdedfn and iminet to reflect the transfer. The value of imintdn is not adjusted if a transfer occurs and thus reflects the Eligible Interest Income Deduction and not the amount actually applied.

Medical Expense Deduction or Tax Credit

The filer is allowed a deduction or tax credit for certain medical expenses paid on behalf of the filer, spouse or dependents. Before 1984, combined medical expenses (in excess of 3% of net income) and charitable donations (not exceeding 20% of net income) under $100 did not require supporting receipts. This was termed the Standard Deduction. In 1984 and subsequent years, all medical expenses claimed required supporting proof to be allowed as a deduction. Furthermore, only medical expenses in excess of 3% of net income were claimable.

The June, 1987 White Paper on Tax Reform proposed the conversion of this deduction into a non-refundable tax credit.

SPSM Implementation

A value of Allowable Medical Expense Deduction (idmeda) exists on the database for each filer. This value represents the 1984 definition which represents medical expenses in excess of 3% of net income. Although medical expenses paid on behalf of dependents are claimable be either spouse, no transfers between spouses are made for this deduction.

The parameter MDCROPT determines the treatment of both medical expenses and charitable donations. If MDCROPT is assigned the value of 1, the combined Medical and Charitable Deduction (imstddn) is calculated as the greater of:

(a) STDED:	the Standard Deduction
(b) idmeda + idchara:	the sum of Net Medical Expenses, Charitable Donations and Gifts to Canada or a province

If MDCROPT is assigned a value of 2, a Medical Expense Tax Credit (immedatc) is calculated as a proportion (MEDTCR) of Net Medical Expenses (idmeda). The Medical Expense Tax Credit is applied to reduce Basic Federal Tax in the function txcalc.

The current implementation of the database and model has no built-in way of allowing the user to change the calculation of medical expenses eligible for the deduction or tax credit. Although the June, 1987 White Paper on Tax Reform states that medical expenses in excess

of 3% of Net Income will be eligible of the tax credit, the post-reform definition of Net Income is different from the pre-reform definition. Since post-reform Net Income does not include deductions for CPP/QPP Contributions, UI Contributions, Tuition Fees or Child Care Expenses, it will be much higher than pre-reform for most filers. Unless otherwise adjusted, this decreases the amount of medical expenses eligible for the tax credit.

Charitable Donations Deduction or Tax Credit

The filer is allowed a deduction or tax credit on behalf of charitable donations and gifts to Canada or a province. Before 1984, combined medical expenses and charitable donations under $100 did not require supporting receipts. This was termed the Standard Deduction.

In 1984, the Standard Deduction was eliminated and all claims for charitable donations required proof. Charitable Donations in excess of 20% of Net Income were not eligible for a deduction but could be carried forward. There was no limit on gifts to Canada or a province.

The June, 1987 White Paper on Tax Reform proposed the conversion of this deduction into a non-refundable tax credit.

SPSM Implementation

The database contains a value for eligible Charitable Donations and Gifts to Canada or a Province (idchara) according to the 1984 definition. The Charitable Donations component of this value is limited to 20% of Net Income.

The parameter MDCROPT determines whether this value is taken as a deduction from Net Income or is converted to a non-refundable tax credit.

If Charitable Donations and Gifts to Canada or a Province are to be treated as a deduction (MDCROPT=1), the combined Medical Expense and Charitable Donation Deduction (imstddn) is calculated as the greater of:

(a) STDED:	the Standard Deduction
(b) idmeda + idchara:	the sum of Net Medical Expenses, Charitable Donations and Gifts to Canada or a province

If charitable donations are to be treated as a tax credit (MDCROPT=2), a two-tier, non-refundable Charitable Donation Tax Credit (imchartc), is calculated. Donations up to a set amount (CHATL1)are converted at the first tax credit rate (CHATR1)and the remainder is converted at the second rate (CHATR2).

The Charitable Donations Tax Credit is a component of the total non-refundable tax credits used to calculate Basic Federal Tax in the function txcalc.

Disability Deduction or Tax Credit

Disabled persons whose impairment has markedly restricted or is expected to restrict their activities of daily living for a continuous period of at least 12 months are eligible to claim a special Disability Deduction or Tax Credit. Before 1988, the value of this deduction was

increased annually. Any unused portion of the deduction could be transferred to a supporting parent or grand-parent.

The June, 1987 White Paper on Tax Reform proposed the conversion of this deduction into a non-refundable tax credit set at $550 in 1988 and increased annually by the annual growth in the Consumer Price Index minus 3 points. According to the White Paper, the tax assistance benefits approximately 250,000 Canadians annually.

SPSM Implementation

The database contains a variable representing the Disability Deduction Claimed (iddisex) in the base year (1984). The value represents the total amount claimed on behalf of the filer, spouse and dependents.

The parameter DISOPT controls whether this value is treated as a deduction from Net Income (DISOPT=1)or is converted to a tax credit (DISOPT=1).

If the Disability Deduction is calculated, the deduction (imdisex) takes on the value assigned to the parameter Maximum Disability Deduction (MAXDX) for all filer with a non-zero value on the database for iddisex .

Although the value of iddisex represents the amount of the Disability Deduction claimed, any portion of the calculated amount (imdisex) not required to reduce the filer's taxable income to zero may be transferred to the spouse. This transfer is made in the function txhstr which also makes the appropriate adjustments to Taxable Income (imitax) and Deductions from Net Income (imdedfn). The value of imdisex is not updated if a transfer occurs.

If the Disability Tax Credit is to be calculated (DISOPT=2), the Disability Tax Credit (imdisatc) is assigned the value of the parameter MAXDTC (Maximum Disability Tax Credit). Any portion of the tax credit not required to reduce Basic Federal Tax to zero may be transferred to the spouse or a supporting parent in the function txcalc.

Education Deduction or Tax Credit

Before 1988, students attending a designated post-secondary educational institution full-time were eligible to claim an Education Deduction which amounted to a flat rate per month of attendance. Any unused portion of the deduction was transferable to a supporting parent or spouse.

The June, 1987 White Paper on Tax Reform proposed the conversion of this deduction into a non-refundable tax credit. The amount of the tax credit was proposed to be a fixed rate per month of attendance. The White Paper proposed a maximum of $600 on the amount of combined Education and Tuition Tax Credit transferred to a supporting parent or spouse.

SPSM Implementation

The parameter EDUCOPT controls whether education expenses are treated as a deduction (EDUCOPT=1) or a tax credit (EDUCOPT=2). The Education Deduction Allowed in 1984

already exists on the database (ideduc). Included in this amount is any transfer from dependents.

If the Education Deduction is to be calculated, the amount in ideduc is simply transferred to the Modeled Education Deduction (imeduc). This amount is also added to imdedfn (Modeled Deductions from Net Income) and subsequently subtracted from iminet (Modeled Net Income). imdedfn and iminet may be later adjusted in the function txhstr to reflect any transfers of the Education Deduction between spouses.

If the education expenses are treated as a tax credit (EDUCOPT=2), the SPSM must first derive the number of months of attendance implied by the value ideduc. This is calculated by dividing ideduc by 50, the number of dollars per month allowed for the Education Deduction in 1984 and rounding the result to the nearest whole month. The Education Tax Credit (imedtxc) is then calculated as the number of months multiplied by the Education Tax Credit per Month (EDTXPM). The function txcalc may transfer unused amounts of the tax credit to a parent or spouse.

Capital Gains Deduction

Since 1985, a deduction has been allowed on behalf of capital gains income. The Capital Gains Deduction is being phased in with an increasing annual deduction limit amounting to $10,000 in 1985 and $25,000 in 1986. The amount an individual may claim during his or her lifetime is limited to a fixed amount. These measures were introduced in the May, 1985 Budget Papers and subsequently modified in the June, 1987 White Paper on Tax Reform.

SPSM Implementation

The Capital Gains Deduction is calculated as the minimum of:

a) the Annual Capital Gains Deduction Limit (The Annual Limit based on gross Capital Gains, CAPGAL, times the Capital Gains Inclusion Rate, CAPGIR, and
a) Taxable Capital Gains (imicapgt) minus:
   - Allowable Business Investment Loss (idcloss)
   - Net Capital Losses of Other Years (idiloss)

The resultant deduction is added to Total Deductions from Net Income (imdedfn).

The database contains no information on the filer's previous Capital Gains Deduction and therefore, the lifetime limit cannot be applied.

Unemployment Insurance Benefit Repayment Payable

If an individual has received Unemployment Insurance Benefits and his or her Net Income exceeds a fixed amount ($38,610 in 1986), a portion of the benefits must be repaid. This repayment is added to Federal Taxes Payable. The amount repaid becomes a deduction from Net Income.

SPSM Implementation

The amount repayable is a proportion (UIBRP) of the UI Benefits received (imiuib) or a proportion of Net Income exceeding the Repayment Level (UIBRA) whichever is less. The Repayment Amount (imuibr) is a proportion (UIBRP) of the lesser of:

(a)	imiuib:	Modeled UI Benefits
(b)	iminet	UIBRA: the amount by which Net Income exceeds the Repayment Level

The value of imuibr is added into the variable imrepay which accumulates modeled repayment amounts. imrepay is added to Total Deductions from Net Income (imdedfn).

Family Allowance and OAS Repayments

The SPSM includes optional algorithms which allow the analysis of certain modifications to Family Allowances and the Old Age Supplement. These algorithms are presented with the SPSD/M for illustrating a glass box application. Users may consult the *SPSD/M Programmer's Guide* for further details.

The Family Allowance Repayment is calculated if the parameter FARR (Family Allowance Repayment Rate) is non-zero. The repayment is calculated as the lesser of:

a) a proportion (FARR) of family net income (the net income of the head plus the net income of the spouse) exceeding the Family Allowance Reduction Level (FATD), and
a) Taxable Family Allowances Received (imtfa).

The OAS repayment is based on the filer's own Net Income and is computed as the lesser of:

a) OAS Received (imioas), and
a) a proportion (OASRR) of Net Income (iminet) exceeding the OAS Repayment Reduction Level (OASTD).

Neither the FA nor the OAS repayments are stored in separate variables. They are accumulated into the variable imrepay which is applied as a deduction from Net Income in the function txitax and is added to Taxes Payable in the function memo1.

CROSS REFERENCE

Function	Description
INPUT PARAMETERS:	
ADDDEDFLAG	Database variable(addded) activation flag
AOPT	Age exemption/credit option [1=deduction,2=credit]
AXM	Age amount
AXPI	Age amount phase in rate for 1994 and beyond
AXRR	Age amount credit reduction rate
AXTD	Age amount net income turndown
BXM	Basic personal exemption/amount
CAPGFLAG	Capital gains deduction flag
CGIFLAG	Capital gains inclusion in interest income deduction flag

```
CHATL1          Charitable donations amount level 1
CHATNF          Charitable donations maximum net income fraction
CHATR1          Charitable donations tax credit rate 1
CHATR2          Charitable donations tax credit rate 2
DISOPT          Disability deduction/credit option [1=deduction,2=credit]
EDUCOPT         Education deduction/credit option [1=deduction,2=credit]
EDXPM           Education amount per month
EMPLOFLAG       Database variable(emplo) activation flag
FNTCR           Federal non-refundable tax credit rate
MAXDX           Maximum disability deduction/amount
MDCROPT         Medical and charitable deduction/credit option
[1=deduction,2=credit]
MEDALL          Medical allowance maximum lower limit
MEDANF          Medical allowance lower limit net income fraction
NORTHFLAG       Database variable(north) activation flag
PARTLOFLAG      Database variable(partlo) activation flag
PEROPT          Personal exemption/credit option [1=deduction,2=credit]
REPNETFLAG      Social program repayments reduce net income flag
STDED           Standard deduction from net income
YINDL           Maximum interest and dividend income deduction
YPNDL           Maximum pension income deduction/amount
YPNOPT          Pension income deduction/credit option
[1=deduction,2=credit]

INPUT VARIABLES:
hhnin           Number of individuals in household
idaddded        Additional deductions from net income (256)
idage           Age
idcapgex        Capital gains exemptions (254)
idcarry         Carrying charges (221)
idcharit        Charitable donations (340)
idcloss         Allowable other years capital loss (253)
iddisoth        Disability amount for dependants (318)
iddisslf        Disability amount for self (316)
ideducm         Eligible months of education allowance
idemplo         Employee home relocation loan dedn (248)
idforavg        Forward averaging amount withdrawal (237)
idgifts         Gifts to Canada/provinces/culture (342)
idiint          Interest income (121)
idipens         Pension income (115)
idmedgro        Medical expenses, gross (330)
idnclos         Allowable other years non-capital loss (252)
idnorth         Northern deductions (255)
idothpe         Other dependant exemptions (305)
idpartlo        Limited partnership losses (251)
idstkded        Stock option deduction (249)
imicapgt        Capital gains (taxable)
imidivt         Dividend income (taxable)
iminet          Net income
imninc          No income flag
imrepay         Social Benefits Repayments

OUTPUT VARIABLES:
imatxc          Age tax credit
imaxm           Age personal exemption
imbtc           Basic personal tax credit
imcapgex        Modelled capital gains deduction (254)
```

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imchara         Allowable charitable donations and gifts (calculated)
imchartc        Charitable donations tax credit
imdedfn         All deductions from net income
imdisatc        Disability tax credit
imdisex         Disability exemption
imedtxc         Education allowance tax credit
imeduc          Education allowance for student (322)
imexm           Personal exemptions (Basic+Age)
imintdn         Interest income deduction allowed
imitax          Taxable income
immeda          Medical expenses allowed (computed)
immedatc        Medical expenses allowed tax credit
impendn         Pension income deduction allowed
impentxc        Pension income tax credit
impex           All personal exemptions and deductions
imstddn         Standard or medical+charitable allowed
```

txman Compute provincial taxes for Manitoba

SUMMARY

Manitoba Basic Provincial Tax (imbpt) is calculated as a proportion (MPTF) of Basic Federal Tax (imbft).

The Manitoba Surtax is a proportion (MSTR) of Basic Provincial Tax (imbpt) exceeding the Manitoba Surtax Level (MSTC). The surtax is added to Basic Provincial Tax to derive Manitoba Tax (imtxp).

The parameter MNRDOPT determines the method used for the Manitoba Tax Reduction.

In 1982, Manitoba applied a method of tax reduction which was based on the Federal Tax Reduction. This method is applied if MNRDOPT is set to 1. The maximum tax reduction was a proportion (MPTF) of the Federal Tax Reduction (imftr). This was reduced by a proportion (MTRF) of Taxable Income (imitax) exceeding the cutoff level (manb) . The cutoff level was derived by looking up the Federal Tax Reduction (imftr) in the Manitoba Tax Reduction Table (MANRD) using the interpolating lookup function lkup1.

If MNRDOPT is set to 2 the Manitoba Tax Reduction (mantr) is calculated as a fixed amount (MTRBR) reduced by a proportion of Taxable Income (imitax).

The Manitoba Tax Reduction (mantr) is subtracted from Manitoba Tax to derive Provincial Tax Payable.

A refundable learning tax credit (immanltc) was added. The credit is equal to MANLTCF times (the tuition amount (idtuit) plus the education amount (ideduc * EDXPM) plus the education amounts transferred from a spouse or kids (imedrcv) minus the education amounts which have been transferred to a spouse or parents (imedtrf)). It is included in the refundable

tax credits (imptc).

CROSS REFERENCE

Function	Description

```
INPUT PARAMETERS:
EDXPM           Education amount per month
MANLTCF         Manitoba learning tax credit factor
MANRD           Manitoba tax reduction table (MNRDOPT=1) [federal
reduction, net income]
MCAXM           Manitoba cost-of-living age credit
MCBCR           Manitoba cost-of-living basic credit rate
MCBXM           Manitoba cost-of-living basic credit
MCDISEX         Manitoba cost-of-living disability credit
MCFINCRR        Manitoba cost-of-living family income reduction rate
MCMXM           Manitoba cost-of-living married credit
MCOLOPT         Manitoba cost-of-living tax credit calculation option
MCSAXM          Manitoba cost-of-living spouse age credit
MCSDISEX        Manitoba cost-of-living spouse disabled credit
MCYCXM          Manitoba cost-of-living young dependants credit
MNITR           Manitoba net income tax rate
MNRDOPT         Manitoba tax reduction calculation option
MNSUROPT        Manitoba surtax calculation option
MPAXM           Manitoba property tax credit senior citizen credit
MPBXM           Manitoba property tax credit basic credit
MPFINCRR        Manitoba property tax credit family income reduction rate
MPMINC          Manitoba property tax credit minimum credit
MPRIR           Manitoba property tax credit rental inclusion rate
MPTC            Manitoba political contribution table [total
donations,donation allowed]
MPTCBEN         Maximum Manitoba political tax credit allowed
MPTF            Manitoba provincial tax fraction
MRAXM           Manitoba tax reduction age credit
MRBXM           Manitoba tax reduction basic credit
MRDISEX         Manitoba tax reduction disability credit
MREMXM          Manitoba tax reduction married equivalent credit
MRMXM           Manitoba tax reduction married credit
MRSAXM          Manitoba tax reduction spouse age credit
MRYCXM          Manitoba tax reduction young dependants credit
MSAXM           Manitoba surtax age credit
MSBXM           Manitoba surtax basic credit
MSDISEX         Manitoba surtax disability credit
MSEMXM          Manitoba surtax married equivalent credit
MSMXM           Manitoba surtax married credit
MSSAXM          Manitoba surtax spouse age credit
MSTC            Manitoba surtax cut-in
MSTR            Manitoba surtax rate
MSYCXM          Manitoba surtax young dependants credit
```

```
MTCINCFL        Manitoba tax credit income definition flag
MTRBR           Manitoba tax reduction basic amount
MTRF            Manitoba tax reduction fraction
MTRSF           Manitoba tax reduction spousal factor

INPUT VARIABLES:
hhnin           Number of individuals in household
hhnnf           Number of nuclear families in household
iddisoth        Disability amount for dependants (318)
iddisslf        Disability amount for self (316)
ideducm         Eligible months of education allowance
idinspo         Person's spouse [pointer]
idprvftc        Provincial foreign tax credit (Form T2036)
idprvpol        Provincial political contributions (565)
idsheltr        Manitoba shelter allowance (T1C-Man)
idspoflg        Person has spouse
idtuitn         Tuition fees (320)
imatxc          Age tax credit
imbft           Basic federal tax
imdisex         Disability exemption
imedrcv         Education and tuition transfered from others
imedtrf         Education and tuition transfered to others
imeduc          Education allowance for student (322)
imftr           Federal tax reduction
imftrt          Federal tax reduction transferred from spouse
imigis          GIS benefits
iminet          Net income
imisa           Social assistance (or replacement program)
imispa          Spouse's allowance
imitax          Taxable income
immartxc        Married tax credit claimed
imnfach         Number of family allowance children claimed
impex           All personal exemptions and deductions
improptx        Imputed property tax paid
imrentpd        Imputed rent paid
imstxcrt        Tax credits transfered from spouse
nfineld         Eldest person in nuclear family [pointer]
nfinspo         Spouse of eldest [pointer]
nfnkids         Number of children in nuclear family
nfspoflg        Nuclear family contains married couple

OUTPUT VARIABLES:
imbpt           Basic provincial tax
immanltc        Manitoba learning tax credit
imnptc          Non-refundable provincial tax credits
impnit          Provincial net income tax
impptc          Provincial Political Contrib Tax Credit
impptxtc        Provincial Property tax tax credit
impsur          Provincial surtax
imptc           Refundable provincial tax credits
imptr           Provincial tax reduction
imtxp           Provincial income tax payable
```

SUMMARY

Basic Provincial Tax (imbpt) and Provincial Taxes Payable (imtxp) for New Brunswick are simply a proportion (BPTF) of Basic Federal Tax (imbft).

Child Tax Benefit

When NBCTBFLG is assigned a value of 1, the New Brunswick Child Tax Benefit calculation is activated. iminbcben is the total benefits received under the New Brunswick Child Benefits program announced in the 1997 New Brunswick Budget and commencing in April 1997. A first component is the base amount, imnbcbc, which is calculated as the base amount per child, NBCBBAS, times the number of children. The level of benefit is reduced, based on family income, at a rate NBCBRRS for families with only one child, and at rate NBCBRR for the others.

If the family gross employment income is higher than a threshold, NBCBECI, then the maximum supplement is NBCBEIS. The supplement is reduced at a rate NBCBESR for each $ of employment income exceeding the threshold FCBECI. If the family income is higher than NBCBETD then the supplement is reduce at a rate NBCBERR. The final value of the work income supplement is stored in imnbwis.

CROSS REFERENCE

Function	Description

```
INPUT PARAMETERS:
BPTC            New Brunsw. political contribution table [total
donations,donation allowed]
BPTCBEN         Maximum New Brunswick political tax credit allowed
BPTF            New Brunswick provincial tax fraction
BSCI            New Brunswick provincial tax above which surtax applies
BSF             New Brunswick provincial surtax rate
CTCINC          CTC family income scaling factor
FCBECI          Child benefits earning supplement cut-in level
NBCBBAS         NB Basic child benefit (per child)
NBCBECI         NB Child benefits earning supplement cut-in level
NBCBEIS         NB Child benefits earned income supplement
NBCBERR         NB Child benefits earning supplement reduction rate
NBCBESR         NB Child benefits earned income supplement rate
NBCBETD         NB Child benefits earning supplement turndown level
NBCBPI          NB Child benefits phase-in rate
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NBCBRR          NB Multi-children family income reduction rate
NBCBRRS         NB Single-child family income reduction rate
NBCBTD          NB child benefits family income turndown
NBCTBFLG        NB child benefit activation flag
PYINC           Deflator to calculate previous year income

INPUT VARIABLES:
hhnin           Number of individuals in household
hhnnf           Number of nuclear families in household
idiemp          Wages & salaries
idisefm         Self-employed income - farming
idisenf         Self-employed income - non-farming
idprvftc        Provincial foreign tax credit (Form T2036)
idprvpol        Provincial political contributions (565)
idsex           Sex
imbft           Basic federal tax
iminet          Net income
imisa           Social assistance (or replacement program)
nfineld         Eldest person in nuclear family [pointer]
nfinspo         Spouse of eldest [pointer]
nfnkids         Number of children in nuclear family
nfspoflg        Nuclear family contains married couple

OUTPUT VARIABLES:
imbpt           Basic provincial tax
imnbcbb         NB child tax Benefits base amount
imnbcben        Total NB child tax Benefits
imnbwis         NB child tax Benefits WIS
imninc          No income flag
imnptc          Non-refundable provincial tax credits
impptc          Provincial Political Contrib Tax Credit
impsur          Provincial surtax
imtxp           Provincial income tax payable
```

txnfld Compute provincial taxes for Newfoundland

SUMMARY

Basic Provincial Tax (imbpt) and Provincial Taxes Payable (imtxp) for Newfoundland are simply a proportion (NPTF) of Basic Federal Tax (imbft).

For Newfoundland, the SPSM calculates provincial surtax (impsur) as NSF percent of provincial taxes (imtxp) above the level NSCI.

A new refundable sales tax credit was modeled and added to the provincial tax credit (imptc). Similar to the federal credit, it allows for NSTCA dollars for each adult, NSTCC dollars for each child, and it reduced starting at family incomes over NSTCL at a rate of NSTCR.

CROSS REFERENCE

Function	Description
INPUT PARAMETERS:	
CTCIFLAG	Refundable tax credits social assistance income inclusion flag
NPTC	Newfoundland political contribution table [total donations,donation allowed]
NPTCBEN	Maximum Newfoundland political tax credit allowed
NPTF	Newfoundland provincial tax fraction
NSCI	Newfoundland provincial tax above which surtax applies
NSF	Newfoundland provincial surtax rate
NSTCA	NFLD sales tax credit amount for adults
NSTCC	NFLD sales tax credit amount for children
NSTCFLAG	NFLD sales tax credit activation flag
NSTCL	NFLD sales tax credit reduction level
NSTCR	NFLD sales tax credit reduction rate
NTCMAX	Newfoundland maximum stock and venture tax credit
PYINC	Deflator to calculate previous year income
INPUT VARIABLES:	
cfageeld	Age of eldest in census family
cfinch	First child in census family [pointer]
cfineld	Eldest person in census family [pointer]
cfinspo	Spouse of eldest [pointer]
cfnchild	Number of children (including 18+)
cfspoflg	Census family contains married couple
hhncf	Number of census families in household
hhnin	Number of individuals in household
idage	Age
idprvftc	Provincial foreign tax credit (Form T2036)
idprvpol	Provincial political contributions (565)
idvencap	Venture capital tax credit (564)
imbft	Basic federal tax
imigis	GIS benefits
iminet	Net income
imisa	Social assistance (or replacement program)
imispa	Spouse's allowance
imitax	Taxable income
OUTPUT VARIABLES:	
imbpt	Basic provincial tax
imninc	No income flag
imnptc	Non-refundable provincial tax credits
impptc	Provincial Political Contrib Tax Credit
impsur	Provincial surtax
imptc	Refundable provincial tax credits
imtxp	Provincial income tax payable

SUMMARY

This function calculates provincial taxes and credits for Nova Scotia. The programs simulated are as follows:

Basic provincial tax
Two level surtax
Family tax reduction
Phamacare tax and tax credits
Provincial foreign tax credit
Provincial political tax credit
Stock savings plan tax credit
Home ownership savings plan tax credit

Basic Provincial Tax

This algorithm first calculates basic provincial tax. Basic provincial tax (imbpt) for Nova Scotia is calculated as a proportion (VPTF) of Basic Federal Tax (imbft). Provincial taxes payable (imtxp) are then initialized to the value of basic provincial tax (imbpt).

Provincial Surtax

The Nova Scotia surtax (impsur) is calculated as VSF percent of provincial taxes (imtxp) above the level VSCI plus VSF2 percent of provincial taxes above the level VSCI2. This amount is then added to provincial taxes payable (imtxp).

Family Tax Reduction

Program Description

The Nova Scotia tax reduction for low income individuals and familes was introduced in 1994. To be eligible for the reduction a filer must be either over age 18, or have a spouse, or be a parent. This a family based tax reduction and only one person of a married couple may claim the reduction. The reduction has perscribed maximum amounts for the claimant, a spouse and children. There is an equivalent to married amount in cases where a claimant has filed for the federal equivalent to married non-refundable tax credit. The total of these amounts is then subject to a family income test.

SPSM Implementation

The calculation closely follows the structure on form T1C (N.S.). Individuals are first tested for eligibility on the basis of age (idage), marital status (idspoflg), and parental status. Parental status is only relevant for young (<19) families and single parents and so is tested using relation to head (idcfrh == 0) and presence of young children (nfnkids).

Persons without a spouse are assigned the basic amount (VTRBAS). Heads of census families with a spouse are assigned the basic and spouse amounts (VTRBAS + VTRSP). Equivalent to married amounts (VTREM) are given to spouseless heads who claim the federal married tax credit (immartxc). Amounts for children are given to the head of the census family. No child amounts are given with respect to children who triggered the equivalent to married amount.

The maximum deduction is then reduced by a fixed proportion (VTRRR) of the net income (iminet) of the head plus spouse (if present) in excess of the income base amount (VTRTD). This calculation is performed for persons without spouses or heads of census families with spouses. The amounts for families with spouses are then assigned to the spouse with the higher net income. The tax reduction thus calculaed is written to the non-refundable provincial tax reduction variable (imptr) and is used to decrease provincial taxes payable (imtxp).

Pharmacare Program

Program Description

Introduced in the 1995 provincial budget, the pharmacare program consists of an annual phamacare premium payable by all seniors and a refundable tax credit for low income seniors.

SPSM Implementation

The pharmacare premium (VPHPREM) is assigned to the variable impeht for all Nova Scotians age 65 or older. This amount is then used to increase provincial taxes payable (imtxp).

The pharmacare refundable tax credit (impehtc) is calculated for all Nova Scotia seniors in receipt of GIS benefits (imigis). It is calculated as the basic tax credit (VPHTC) less a fixed proportion (VPHRR) of income (imgisinc) above a threshold (VPHTD). The pharmacare refundable tax credit (impehtc) is added to the variable for refundable provincial tax credits (imptc).

Provincial Foreign Tax Credit

The provincial foreign tax credit is imputed from the Greenbook (idprvftc). Only the amount of the foreign tax credit required to reduce provincial tax payable (imtxp) to zero is applied to the variable for non-refundable provincial tax credits (imnptc). Provincial tax payable (imtxp) is then reduced by the amount imnptc.

Political Contribution Tax Credit

CROSS REFERENCE

Function	Description

INPUT PARAMETERS:

VHOSPMAX	Maximum Nova Scotia HOSP contributions per person
VHOSPR	Nova Scotia qualified single parent family income adjustment rate
VHOSPRM	Nova Scotia qualified family income adjustment rate
VHOT	Nova Scotia HOSP credit rate [net income, tax credit rate]
VHOTM	Nova Scotia HOSP credit rate: Married [family net income, tax credit rate]
VPHPREM	Nova Scotia pharmacare premium
VPHRR	Nova Scotia pharmacare tax credit reduction rate
VPHTC	Nova Scotia pharmacare refundable tax credit
VPHTD	Nova Scotia pharmacare tax credit turndown
VPTC	Nova Scotia political contribution table [total donations,donation allowed]
VPTCBEN	Maximum Nova Scotia political tax credit allowed
VPTF	Nova Scotia provincial tax fraction
VSCI	Nova Scotia provincial tax above which surtax applies
VSCI2	Nova Scotia provincial tax above which surtax applies (2nd level)
VSF	Nova Scotia provincial surtax rate
VSF2	Nova Scotia provincial surtax rate (2nd level)
VTRBAS	Nova Scotia tax reduction basic amount
VTREM	Nova Scotia tax reduction equivalent to spouse amount
VTRKID	Nova Scotia tax reduction child amount
VTRRR	Nova Scotia tax reduction family income reduction rate
VTRSP	Nova Scotia tax reduction spouse amount
VTRTD	Nova Scotia tax reduction family income turndown

INPUT VARIABLES:

cfspoflg	Census family contains married couple
hhnin	Number of individuals in household
idage	Age
idcf	Person's census family [pointer]
idcfrh	Relationship to census family head
idhosslf	Hosp. contributions - self (598)
idhosspo	Hosp. contributions - spouse (599)
idnf	Person's nuclear family [pointer]
idprvftc	Provincial foreign tax credit (Form T2036)
idprvpol	Provincial political contributions (565)
idspoflg	Person has spouse
imbft	Basic federal tax
imgisinc	Individual's income for GIS/SPA reduction
imigis	GIS benefits
iminet	Net income
immartxc	Married tax credit claimed
nfnkids	Number of children in nuclear family

OUTPUT VARIABLES:

```
idinspo         Person's spouse [pointer]
imbpt           Basic provincial tax
imnptc          Non-refundable provincial tax credits
impeht          Provincial elderly health tax
impehtc         Provincial elderly health tax credit
imphotc         Provincial HOSP tax credits
impptc          Provincial Political Contrib Tax Credit
impsur          Provincial surtax
imptc           Refundable provincial tax credits
imptr           Provincial tax reduction
imtxp           Provincial income tax payable
```

txont Compute provincial taxes for Ontario

SUMMARY

The Ontario Provincial Tax (imbpt) is calculated as a proportion (OPTF) of Basic Federal Tax (imbft). Added to Basic for some years is the Social Services Maintenance Tax which is a proportion (OSSMR) of Basic Provincial Tax (imbpt) exceeding the tax level (OSSML).

Ontario provides a tax reduction for persons with a low taxable income. This reduction amounts to a proportion (OTRF) of taxable income (imitax) below the Ontario Tax Reduction Level (OMTY). This is subtracted from Basic Provincial Tax to derive Provincial Tax Payable (imtxp).

Employer Health Tax added (imonteht). It only applies to self-employed persons, and is calculated when OEHTFLAG is set to 1. When a person's income from self-employment is less OEHTTD1, the Employer Health Tax is calculated using the rate OEHTRR1 on self-employment earnings over the exemption OEHTEX. When a person's income from self-employment is less than this value, but greater than OEHTTD1, the Employer Health Tax is calculated by adding OEHTRR1 times the difference between the first turndown (OEHTTD1) and the exemption rate (OEHTEX) and OEHTRR2 times the difference between earnings from self-employment and OEHTTD1. When self-employment earnings are greater than OEHTTD2, the Ontario Employer Health Tax is calculated as OEHTRR3 times earnings from self-employment which are greater than the exemption OEHTEX.

Refundable childcare tax credit added (imoccea). The credit is calculated when the parameter OCCEAFLG is set to 1, the maximum amount of the benefit is calculated as the lower of either actual child care expenses (imccet) or of a specified amount per child (OCCEAYNG) times the number of children age 6 and under in the census family. Maximum family benefits are then reduced by a proportion (OCCEARR) of family net income above the threshold (OCCEATD). The model assigns the imputed Child Care credit (imoccea) to the mother if present or otherwise to the head of the census family.

CROSS REFERENCE

Function	Description
INPUT PARAMETERS:	
BXM	Basic personal exemption/amount
CCEATFLG	CCEA eligible->claimable transformation activation flag
CCEATFR	CCEA eligible->claimable fraction
CCEATLL	CCEA eligible->claimable lower limit
OCCEAFLG	Ont. Child Care Expense Credit activation flag
OCCEARR	Ont. Child Care Expense Credit benefit reduction rate
OCCEATD	Ont. Child Care Expense Credit family income turndown
OCCEAYNG	Ont. Child Care Expense Credit allowance per child
OEHTDRR	OEHT - Income Tax Deduction Rate
OEHTEX	OEHT - Exemption
OEHTFLAG	OEHT - Ontario Employer Health Tax Flag
OEHTRR1	OEHT - Rate 1
OEHTRR2	OEHT - Rate 2
OEHTRR3	OEHT - Rate 3
OEHTTD1	OEHT - Turndown 1
OEHTTD2	OEHT - Turndown 2
OHCMAX	Ontario maximum individual HOSP contribution
OHIRF	Ontario HOSP family income reduction factor
OHT	Ontario HOSP tax credit factor table
OMTY	Ontario tax reduction limit
OPOCAR	Ontario property tax percent of occupancy cost
OPOCM	Ontario property tax maximum occupancy cost
OPRIR	Ontario property tax credit rental inclusion rate
OPSIOPT	Ontario property/sales tax credit income concept
OPSMAX	Ontario property/sales tax credit maximum
OPSTITD	Ontario property/sales tax credit income turndown
OPTC	Ontario political contribution table [total donations,donation allowed]
OPTCBEN	Maximum Ontario political tax credit allowed
OPTF	Ontario provincial tax fraction
ORDOPT	Ontario tax reduction calculation option
OSPOCM	Ontario seniors property tax maximum occupancy cost
OSPPE	Ontario sales tax credit % personal exemptions
OSSML	Ontario surtax first cut-in level
OSSML2	Ontario surtax second cut-in level
OSSMR	Ontario surtax first level rate
OSSMR2	Ontario surtax second level rate
OSSTCP	Ontario seniors sales tax credit percent of income
OSTCB	Ontario sales tax credit basic credit
OSTCD	Ontario sales tax credit dependant credit
OSTCFLAG	Ontario seniors tax credit claimed flag
OSTCNIBA	Ontario seniors tax credit net income base amount
OSTCOPT	Ontario sales tax credit calculation option
OSTCP	Ontario sales tax credit percent of income
OSTCS	Ontario sales tax credit spouse credit
OTCNIBA	Ontario tax credit net income base amount
OTRBPA	Ontario tax reduction basic personal amount

OTRDCA	Ontario tax reduction dependant child amount
OTRDDA	Ontario tax reduction disabled dependant amount
OTRF	Ontario tax reduction Ontario tax multiplier
OTRFP	Ontario tax reduction personal amount multiplier

INPUT VARIABLES:

cfinch	First child in census family [pointer]
cfineld	Eldest person in census family [pointer]
cfinspo	Spouse of eldest [pointer]
cfnkids	Number of children in census family
cfspoflg	Census family contains married couple
hhncf	Number of census families in household
hhnin	Number of individuals in household
idage	Age
idccet	Child care expenses associated with child
idccett	Child care expenses (Limit A, Form T778)
idcfrh	Relationship to census family head
iddisoth	Disability amount for dependants (318)
idhomstu	College res/resdnt homeowner assist (558)
idhosslf	Hosp. contributions - self (598)
idhosspo	Hosp. contributions - spouse (599)
idinspo	Person's spouse [pointer]
idisefm	Self-employed income - farming
idisenf	Self-employed income - non-farming
idnf	Person's nuclear family [pointer]
idprvftc	Provincial foreign tax credit (Form T2036)
idprvpol	Provincial political contributions (565)
idsex	Sex
idspoflg	Person has spouse
imbft	Basic federal tax
imigis	GIS benefits
iminet	Net income
imisa	Social assistance (or replacement program)
imispa	Spouse's allowance
imitax	Taxable income
immarex	Married exemption claimed
immartxc	Married tax credit claimed
imnfach	Number of family allowance children claimed
impex	All personal exemptions and deductions
improptx	Imputed property tax paid
imrentpd	Imputed rent paid
nfnkids	Number of children in nuclear family

OUTPUT VARIABLES:

imbpt	Basic provincial tax
imninc	No income flag
imnptc	Non-refundable provincial tax credits
imoccea	Ont. Child Care Exp. credit allowed (Family)
imoccec	Ont. Child Care Exp. credit allowed (child)
imonteht	Ontario Employers Heath Tax (Self-employed)
impptc	Provincial Political Contrib Tax Credit
impsur	Provincial surtax
imptc	Refundable provincial tax credits
imptr	Provincial tax reduction
imtxp	Provincial income tax payable

txpei Compute provincial taxes for P.E.I.

SUMMARY

Basic Provincial Tax (imbpt) and Provincial Taxes Payable (imtxp) for Prince Edward Island are simply a proportion (PPTF) of Basic Federal Tax (imbft).

CROSS REFERENCE

Function **Description**

```
INPUT PARAMETERS:
PPTC            P.E.I. political contribution table [total
donations,donation allowed]
PPTCBEN         Maximum P.E.I. political tax credit allowed
PPTF            P.E.I. provincial tax fraction
PSCI            P.E.I. provincial tax above which surtax applies
PSF             P.E.I. provincial surtax rate

INPUT VARIABLES:
hhnin           Number of individuals in household
idprvftc        Provincial foreign tax credit (Form T2036)
idprvpol        Provincial political contributions (565)
imbft           Basic federal tax

OUTPUT VARIABLES:
imbpt           Basic provincial tax
imnptc          Non-refundable provincial tax credits
impptc          Provincial Political Contrib Tax Credit
impsur          Provincial surtax
imtxp           Provincial income tax payable
```

txprov Compute provincial taxes

SUMMARY

Provincial income taxes are collected by the federal government on behalf of most provinces. Quebec collects its own income tax. Algorithms for computing provincial tax range from taking a proportion of Basic Federal Tax as in Newfoundland, Prince Edward Island, New Brunswick and Nova Scotia to a parallel of the federal system in Quebec. The other

provinces begin with a proportion of federal taxes but have their own systems of tax credits, surtaxes and reductions.

The value for Provincial Tax Credits (idptc) on the database is derived from actual income tax records (for details, see the *SPSM Database Creation Guide*). This value incorporates several provincial tax credits:

- Provincial Foreign Tax Credits
- Alberta Royalty Tax Credit
- Provincial Royalty Tax Credit
- Provincial Property Tax Credit
- Ontario Student Residence Claim
- Manitoba Resident Homeowner Advance
- Manitoba Investment Tax Credit
- Provincial Political Contribution Tax Credit
- Saskatchewan Venture Capital Tax Credit Allowed
- Saskatchewan Livestock Investment Tax Credit Allowed

These Provincial Tax Credits reported in (idptc) are transferred to the variable which stores all Provincial Tax Credits (imptc). This transfer is intended to provide a framework for the eventual modeling of some of these tax credits.

CROSS REFERENCE

Function	Description

```
INPUT VARIABLES:
hdprov          Province
```

txqcalc Calculate income tax (Quebec)

SUMMARY

The txqcalc function calculates Quebec income tax for those individuals affected. It can be used to calculate either pre-1984 Quebec income tax or post-1988 (post-reform) income tax through the use of the parameter QREFOPT.

Program Description

Due to the complexity of the post-1988 reform Quebec income tax system, it has been

implemented in SPSM as a separate function.

SPSM Implementation

txqcalc can compute tax in two quite different ways, depending on the value of parameter QREFOPT.

If QREFOPT is set to 1, a pre-reform algorithm, very similar to that used in drv for computing federal tax is used.

If QREFOPT is set to 2, then a different algorithm is used. Each census family is processed in turn. First, the basic provincial tax is computed via a table look-up for each person. Next the non-refundable tax credits are applied and unused credits are transferred between spouses, if appropriate. Subsequently, the 'family situation' and 'eligible income' are computed followed by the family tax reduction. After the family tax reduction has been calculated, the refundable property tax credit is computed.

Relation to Other SPSM Routines

txqcalc is called from within txprov and is in a subsidiary relationship to it. It does not call, and is not called by, any further functions.

Sales tax credit

The refundable sales tax credit (imqstr) is activated when QSTRFLAG is set to 1. The sales tax credit includes a base credit (QSTRBCRD), a credit (QSTRCHILD) is added for each child in the family. A second credit is added (QSTRFTP3) when no spouse is present and at least one dependent child is present, And finally another credit is added (QSTRFTP4) is for a person living alone or with at least one dependent. The credit is reduced by the income considered at a rate QSTRRR.

CROSS REFERENCE

Function	Description
INPUT PARAMETERS:	
CCEATFLG	CCEA eligible->claimable transformation activation flag
CCEATFR	CCEA eligible->claimable fraction
CCEATLL	CCEA eligible->claimable lower limit
QAARC	Quebec availability allowance (refundable credit) [parity,$]
QAARCFLAG	Availability Allowance: Refundable Tax Credit
QBXM	Quebec basic personal exemption/amount
QCCEAOLD	Quebec CCEA old child limit
QCCEAYNG	Quebec CCEA young child limit

```
QCCEOPT         Quebec CCE calculation option [1=deduction,2=refundable
credit]
QCCETCR         Refundable CCE credit rate [net income, % cce claimable]
QCTCDEPA        Quebec consumer tax credit dependant amount
QCTCFLAG        Quebec consumer tax credit activation flag
QDTCR           Quebec dividend tax credit rate
QEIA1           Quebec eligible income family type #1
QEIA2           Quebec eligible income family type #2
QEIA3           Quebec eligible income family type #3
QEIA4           Quebec eligible income family type #4
QEIA5           Quebec eligible income family type #5
QEIAA           Quebec eligible income aged amount
QFARFLAG        Quebec family allowance repayment flag
QFTRA1          Quebec family tax reduction family type #1
QFTRA2          Quebec family tax reduction family  type #2
QFTRA3          Quebec family tax reduction family type #3
QFTRA4          Quebec family tax reduction family type #4
QFTRFLAG        Quebec family tax reduction activation flag
QFTRRR          Quebec family tax reduction reduction rate
QHSCI           Quebec surtax first cut-in level
QHSCI2          Quebec surtax second cut-in level
QHSF            Quebec surtax first level rate
QHSF2           Quebec surtax second level rate
QNTCR           Quebec nominal tax credit rate
QPTC            Quebec political contribution table [total
donations,donation allowed]
QPTCBEN         Maximum Quebec political tax credit allowed
QPTRGISB        Quebec property tax rebate GIS bonus
QPTRMTP         Quebec property tax minimum tax per person
QPTRMTR         Quebec property tax maximum tax for reduction
QPTRRR          Quebec property tax rebate reduction rate
QPTRTF          Quebec property tax fraction
QREFOPT         Quebec deduction/credit option [1=deduction,2=credit]
QRTRFLAG        Quebec real estate rebate activation flag
QSTRBCRD        Quebec sales tax rebate base credit
QSTRCHILD       Quebec sales tax rebate children dependent credit
QSTRFLAG        Quebec sales tax rebate activation flag
QSTRFTP3        Quebec sales tax rebate family type 3 credit
QSTRFTP4        Quebec sales tax rebate family type 4 credit
QSTROPT         Quebec sales tax rebate option=1 based on idigis, =2
otherwise
QSTRRR          Quebec sales tax rebate reduction rate
QTRBE           Quebec Tax Reduction Breakeven
QTROPT          Quebec Tax Reduction calcualtion option 1=universal
2=income tested
QTRP            Quebec tax Reduction proportion
QTX             Quebec income tax table [taxable income,basic provincial
tax]

INPUT VARIABLES:
cfin            First person in census family [pointer]
cfinch          First child in census family [pointer]
cfineld         Eldest person in census family [pointer]
cfinspo         Spouse of eldest [pointer]
cfnkids         Number of children in census family
cfnpers         Number of persons in census family
cfspoflg        Census family contains married couple
```

hdnadult	Number of adults in household
hhncf	Number of census families in household
hhnin	Number of individuals in household
idage	Age
idccet	Child care expenses associated with child
idccett	Child care expenses (Limit A, Form T778)
idcfrh	Relationship to census family head
idprvpol	Provincial political contributions (565)
idrpp	Registered pension plan contributions (207)
idrrsp	RRSP calculated amount (208)
idsex	Sex
imigis	GIS benefits
imisa	Social assistance (or replacement program)
imispa	Spouse's allowance
impfa	Provincial family allowance
improptx	Imputed property tax paid
imqatc	Quebec age tax credit
imqbtc	Quebec basic tax credit
imqcdeds	Quebec dependent children deduction
imqcpptc	Quebec CPP/QPP contributions tax credit
imqdctc	Quebec dependent child tax credits
imqdedt	Quebec deductions transfered from spouse
imqdistc	Quebec disability tax credit
imqhsfc	Quebec Health Services Fund Contributions
imqhsftc	Quebec Health Services Fund Cont.tax credit
imqidivt	Quebec taxable dividends
imqinet	Quebec net income
imqitax	Quebec taxable income
imqlatc	Quebec living alone tax credit
imqmeda	Quebec medical expenses allowed
imqmtc	Quebec married tax credit
imqndc	Quebec number of dependent children
imqritc	Quebec retirement income tax credit
imqtfa	Quebec taxable family allowances
imquictc	Quebec UI contributions tax credit

OUTPUT VARIABLES:

imbpt	Basic provincial tax
imnptc	Non-refundable provincial tax credits
impptc	Provincial Political Contrib Tax Credit
impsur	Provincial surtax
imptc	Refundable provincial tax credits
imptr	Provincial tax reduction
imqaarc	Quebec Availability Allowance Refunded Tax Credit
imqcceni	Quebec net income for refundable cce credit calculation
imqccetc	Quebec refundable child care expenses Tax Credit
imqdtxc	Quebec dividend tax credit
imqei	Quebec eligible income for tax reduction
imqfs	Quebec family situation (1-5)
imqftr	Quebec family tax reduction
imqittr	Quebec income tested tax reduction
imqptr	Quebec property tax refund
imqrepay	Quebec repayments
imqstr	Quebec sales tax refund
imqtca	Quebec tax credits applied
imqtct	Quebec tax credits transferable
imqtcts	Quebec tax credits transferred from spouse

```
imqtottc        Quebec total tax credits
imtxp           Provincial income tax payable
```

txqccea Compute child care expense allowance (Quebec)

SUMMARY

Since the amounts allowable for the Child Credit Expense Deduction differ slightly between the federal and Quebec provincial tax systems, it would be desirable to use the actual amount allowed for Quebec provincial tax purposes in the calculation of this deduction. The rules for eligibility exactly parallel the federal (see txccea). The algorithms are therefore essentially the same as the ones modeling the allocation of the federal Child Care Expense Deduction.

Unlike the federal algorithm, child care expenses are always treated as a deduction from total income. There is no option for treating them as a tax credit.

CROSS REFERENCE

Function **Description**

```
INPUT PARAMETERS:
CCEATFLG        CCEA eligible->claimable transformation activation flag
CCEATFR         CCEA eligible->claimable fraction
CCEATLL         CCEA eligible->claimable lower limit
QCCEAC1         Quebec CCEA earned income fraction (1 child)
QCCEAC2         Quebec CCEA earned income fraction (2 children)
QCCEAC3         Quebec CCEA earned income fraction (3+ children)
QCCEAOLD        Quebec CCEA old child limit
QCCEAYNG        Quebec CCEA young child limit
QCCEOPT         Quebec CCE calculation option [1=deduction,2=refundable
credit]

INPUT VARIABLES:
cfinch          First child in census family [pointer]
cfineld         Eldest person in census family [pointer]
cfinspo         Spouse of eldest [pointer]
cfnkids         Number of children in census family
cfspoflg        Census family contains married couple
hhncf           Number of census families in household
idage           Age
idccet          Child care expenses associated with child
idccett         Child care expenses (Limit A, Form T778)
idiemp          Wages & salaries
idisefm         Self-employed income - farming
idisenf         Self-employed income - non-farming
```

```
OUTPUT VARIABLES:
imqccea         Quebec child care expenses allowed (dedn)
imqdedft        Quebec deductions from total income
imqinet         Quebec net income
```

txqhstr Compute family-related deductions or credits (Quebec)

SUMMARY

This function parallels txhstr which performs similar calculations for federal taxes. The major difference is that the model does not incorporate the conversion of deductions into tax credits for the calculation of Quebec taxes. The algorithms include:

- calculate and allocate Personal Exemptions for Wholly Dependent Children
- calculate and allocate Married Exemption
- calculate Family Support Exemption (similar to federal Married Equivalent Exemption)
- calculate and transfer deductions from spouse

Calculate and Allocate Personal Exemptions for Wholly Dependent Children

Quebec filers with dependent children are eligible to claim an exemption based on the age and net income of the child. The exemption is calculated as a fixed amount minus a proportion of the child's net income exceeding the reduction level. The young child exemption is claimable on behalf of children aged 16 or 17. The old child exemption is claimable on behalf of children 18 and over but under 21, or over 20 and attending school full-time.

For taxation year 1986 and later, the definition of dependant's net income for the purpose of calculating the Exemption for Wholly Dependent Children requires the addition of the following amounts on non-taxable income to the standard definition of net income:

- Guaranteed Income Supplement, Spouse's Allowance
- CSST Compensation
- Social Aid Benefits
- earnings from international sources which are tax exempt in Canada

SPSM Implementation

The amount of the exemption on behalf of children 16 or 17 is calculated by subtracting a proportion (QYCR) of the child's Net Income (imqinet) which exceeds the Reduction Level (QYCT) from the Maximum Young Child Exemption (QYCX).

If the child is 18 or over but under 21, or over 20 and attending school full-time, the amount of the exemption is calculated by subtracting a proportion (QOCR)of the child's Net Income (imqinet) which exceeds the Reduction Level (QOCT) from the Maximum Old Child Exemption (QOCX).

The exemptions for all children are accumulated in cdeds which may later be adjusted by the calculation of the Family Support Exemption. If a spouse is present, the one with the higher Net Income (imqinet) receives the full amount of the exemption for all dependent children (imqcdeds) which is used to reduce Taxable Income (imqitax).

The model does not partition the exemptions for dependent children between spouses as is allowed by the tax regulations. This means that the tax burden of spouses with similar net incomes is not minimized.

In calculating the amount of the exemption, the model does not adjust the Net Income of the dependant to include certain non-taxable amounts of the Guaranteed Income Supplement (GIS), Spouse's Allowance (SPA) or Social Assistance as is specified in the Quebec tax regulations.

Calculate and Allocate Married Exemption

Persons legally married during the taxation year are eligible to claim a Married Exemption amounting to a fixed value reduced by a proportion of the spouse's net income exceeding a reduction level. The definition of spouse's net income for the purpose of calculating the Married Exemption requires the addition of the following amounts on non-taxable income to the standard definition of net income:

- Guaranteed Income Supplement, Spouse's Allowance
- CSST Compensation
- Social Aid Benefits
- earnings from international sources which are tax exempt in Canada

SPSM Implementation

The Married Exemption (imqmarex) is calculated only for the spouse with the lower Net Income (imqinet). It amounts to a fixed value (QMXM) reduced by a proportion (QMXR) of the other spouse's Net Income which exceeds the Reduction Level (QMXT). imqmarex is used to reduce the taxable income (imqitax) of the claiming spouse.

Note that the value of Net Income is not adjusted to include GIS, SPA, Social Aid and non-taxable amounts from international sources. GIS and SPA are calculated later in the model and the amounts are not available when this function is executed. Non-taxable amounts from international sources cannot be separated from other non-taxable income in the database.

Calculate Family Support Exemption

The definition of the Family Support Exemption is similar to the federal Married Equivalent Exemption. Filers who are single, divorced, separated or widowed and who supported a relative related by blood, marriage or adoption are eligible to claim that relative for a Family Support Exemption. This exemption amounts to a fixed value reduced by a proportion of the dependant's net income exceeding a reduction level.

The definition of the dependant's net income for the purpose of calculating the Family Support Exemption requires the addition of the following amounts on non-taxable income to

the standard definition of net income:

- Guaranteed Income Supplement, Spouse's Allowance
- CSST Compensation
- Social Aid Benefits
- Earnings from international sources which are tax exempt in Canada

SPSM Implementation

SPSM calculates the Family Support Exemption on behalf of dependent children and not other relatives who may be eligible.

The model attempts to make the claim on behalf of the dependant for whom a claim will benefit the filer most. The first choice for the exemption is a dependant who is not claimable for the child exemption, i.e., one who is 15 years of age or younger, or one who is over 21 and not attending an educational institution. If more than one dependant is eligible under these conditions, then the one with the lower Net Income (imqinet) is chosen. If there is no such dependant, the dependant claimable for the child exemption with the lowest Net Income is chosen.

The Family Support Exemption (imqmarex) is calculated as a fixed amount (QMXM) reduced by a proportion (QMXR) of the dependant's Net Income (inet) exceeding the Reduction Level (QMXT).

If the Family Support Exemption is claimed on behalf of a dependant who is also claimable for the child exemption, the accumulated amount of the child exemption (cdeds)is adjusted by subtracting the amount claimed for that dependant (cdedt).

The Family Support Exemption (imqmarex) is added to Total Personal Exemptions (imqpex) and subtracted from Taxable Income (imqitax).

Calculate and Transfer Deductions From Spouse

As in the federal case (see the function txhstr) Quebec allows the transfer of certain deductions from the spouse in the calculation of provincial income taxes. Deductions which may be transferred are:

- Age Exemption
- Interest and Dividend Income Deduction
- Deduction for Retirement Income
- Disability Deduction

Only the amount not required to reduce the spouse's taxable income to zero may be transferred. There is a limit to the amount of combined Interest and Dividend Income Deduction and Pension Income Deduction transferable which amounts to the unused proportion of the Married Exemption, i.e., if the full Married Exemption was claimed, no portion of these two deductions may be transferred.

SPSM Implementation

For the spouse with the lower Net Income (imqinet) the model calculates a value for potentially transferable deductions (dedt)as the sum of:

- Age Exemption (imqaxm)
- Disability Deduction (imqdisex)

the lesser of:

- Total Pension Income Deduction (imqpendn) and Interest Income Deduction (imqintdn), and
- the unused portion of the Married Exemption (QMXM minus imqmarex).

minus any amount required to reduce the spouse's Taxable Income to zero (imqinet minus QBXM).

The amount transferred from the spouse (dedt)is subtracted from the filer's Taxable Income (imqitax) and added to Total Deductions from Net Income (imqdedfn). The spouse's Taxable Income and deductions are not adjusted because, if a transfer occurs, taxable income is zero by definition. The amounts recorded for the individual deductions (e.g., imqaxm, imqpendn) are not adjusted to reflect the transfer.

The value of Net Income used in the calculation of the transfer is not adjusted to include GIS, SPA and Social Aid income.

CROSS REFERENCE

Function	Description
INPUT PARAMETERS:	
QBXM	Quebec basic personal exemption/amount
QCXMOPT	Quebec child exemption method option (1=pre-86 2=86+)
QDEPNIFG	Quebec include SA, etc. in dependant's net income
QLAXM	Quebec living alone exemption/amount
QLPXM	Quebec lone parent exemption/amount
QMXM	Quebec married exemption/amount
QMXT	Quebec married exemption turndown
QNTCR	Quebec nominal tax credit rate
QOCT	Quebec exemption turndown for children 18 and over
QOCX	Quebec exemption for children 18 and over
QPSXM	Quebec post-secondary exemption/amount
QREFOPT	Quebec deduction/credit option [1=deduction,2=credit]
QYCT	Quebec exemption turndown for children 16 or 17
QYCX	Quebec exemption for children 16 or 17
QYCXM1	Quebec dependent child #1 amount
QYCXM2	Quebec dependent child #2 amount
INPUT VARIABLES:	

```
cfinch          First child in census family [pointer]
cfineld         Eldest person in census family [pointer]
cfinspo         Spouse of eldest [pointer]
cfnchild        Number of children (including 18+)
cfspoflg        Census family contains married couple
hdnpers         Number of persons in household
hhncf           Number of census families in household
hhnin           Number of individuals in household
idage           Age
idestat         Educational status
imigis          GIS benefits
imisa           Social assistance (or replacement program)
imispa          Spouse's allowance
imqaxm          Quebec age personal exemption
imqdisex        Quebec disability exemption
imqinet         Quebec net income
imqintdn        Quebec interest income deduction allowed
imqpendn        Quebec pension income deduction allowed

OUTPUT VARIABLES:
imqcdeds        Quebec dependent children deduction
imqdctc         Quebec dependent child tax credits
imqdedfn        Quebec all deductions from net income
imqdedt         Quebec deductions transfered from spouse
imqdepni        Quebec dependant's net income
imqitax         Quebec taxable income
imqlatc         Quebec living alone tax credit
imqmarex        Quebec married exemption claimed
imqmtc          Quebec married tax credit
imqndc          Quebec number of dependent children
imqpex          Quebec personal exemptions and deductions
```

txqinet Compute net income (Quebec)

SUMMARY

The Quebec provincial personal income tax system largely parallels the federal system: deductions and exemptions reduce total income to a taxable amount for which the basic provincial tax is calculated, then tax credits are applied to derive the amount of provincial tax payable. The function calculates net income for Quebec taxpayers and is similar to the process for calculating net income for federal income tax purposes.

SPSM Implementation

The algorithms for calculating Net Income for Quebec Provincial Income Tax Purposes is similar to the algorithms for calculating federal Net Income described under the function txinet. The major difference is that there are no options to treat deductions and personal exemptions as tax credits.

Whenever possible values already calculated in the computation of federal Net Income are applied here. The implementation of specific measures are described below.

Employment Expense Deduction

The calculation of the Quebec Employment Expense Deduction (imqdedea) is the same as the federal case. imqdedea is a proportion (QEAP) of Earnings from Employment (idiemp) up to a maximum deduction of QEAMAX. There is no flag controlling the calculation of this value. If this deduction is to be eliminated, the values of QEAP and QEAMAX may be set to zero.

This value is added into Total Deductions from Total Income (imqdedft) in contrast to the federal algorithm in which the amount is subtracted from Total Income.

Other Allowable Employment Expenses

The model assumes that the definition for Other Allowable Employment Expenses as applied to Quebec Provincial Taxes is the same as the federal definition (see txinet). The same value as used in the federal algorithm (idalexp) is used here. The value of idalexp may be scaled up or down by supplying an appropriate value for the parameter QALEXPP (Proportion of Other Allowable Employment Expenses to Use as a Deduction).

The amount idalexp is added to Total Deductions from Total Income (imqdedft) in contrast to the federal algorithm in which the amount is subtracted from Total Income.

Calculate Taxable Capital Gains

Capital Gains are treated as they are for federal taxes (see function txinet). Taxable Capital Gains for Quebec Provincial Tax Purposes (imqcapgt) is calculated as Total Capital Gains Received (idicapg) multiplied by the Capital Gains Inclusion Rate for Quebec Provincial Taxes (QDGUR).

Taxable Dividends

The the treatment of dividends is similar to the federal algorithms described under the function txinet. Taxable Dividends for Quebec Provincial Taxes (imqidivt) are calculated as Total Dividends Received (ididiv) multiplied by the Quebec Dividend Gross-up Rate (QDGUR).

Calculation of Total Income

As in the federal case (see function txinet), Total Income at this stage does not include Family Allowances which cannot be allocated until it is known whether the mother or the father have the higher net income. Total Income (imqitot) is calculated as the sum of:

idiemp:	Earnings From Employment
idisenf:	Self-employment Earnings (Non-farm), optionally scaled by the parameter FACTISENF
idisefm:	Self-employment Earnings (farm)

idiroom: Net Income From Roomers and Borders
idiint: Interest Income
idioinv: Other Investment Income
idicqp: CPP/QPP Benefits Received
iditogv: Other Taxable Government Income
idipens: Pension Income
iditoth: Other Taxable Income
imiuib: Modeled Unemployment Insurance Benefits Received
imiotg: Modeled New Taxable Demogrants
imffa: Modeled family allowance Benefits (optional)
imioas: Modeled OAS Benefits
imqidivt: Modeled Taxable Amount of Dividends for Quebec
imqcapgt: Modeled Taxable Capital Gains and Losses for Quebec

The parameter QFAIFLAG controls whether federal Family Allowances are included in total income. If QFAIFLAG is set to one then imffa is added to imqitot. Also, Employment Expenses (imqdedea) and Other Allowable Employment Expenses (imqalexp) are added into All Deductions from Total Income (imqdedft) and not subtracted from Total Income as in the federal algorithms.

Calculation of Net Income

All Deductions from Total Income (imdedft) is calculated as the sum of:

idrpp: Registered Pension Plan Contributions
idrrsp: Registered Retirement Savings Plan Contributions
iddues: Union and Professional Dues
idtuitn: optionally, Tuition Fees
idiloss: Allowable Business Investment Loss
idothded: Other Deductions from Total Income (includes Moving Expenses, Alimony Paid, Repayment of Income Amounts, Legal and Accounting Fees, Petroleum Exploration Ventures, Capital Cost Allowance on Canadian Motion Picture Films and Video Tapes)
idcarry: Carrying Charges (interest on money borrowed to earn investment income)
imcqppc: optionally, CPP/QPP Contributions (calculated in txinet)
imuic: optionally, UI Contributions (calculated in txinet)
imqccea: optionally, Child Care Expense Deduction Allowed (calculated separately in function txqccea)
imqdedea: Employment Expenses
imqalexp: Other Allowable Employment Expenses

Please note that the Quebec algorithms are current for taxation year 1984. Unlike the algorithms modeling the federal tax system, there are, at this time, no switches for the optional treatment of deductions as tax credits. The algorithms for Quebec do not currently implement either the Capital Gains Deduction or the Alternative Minimum Tax.

CROSS REFERENCE

Function **Description**

```
INPUT PARAMETERS:
QALEXP          Quebec proportion of other allowable employment expenses to
use
QCAPGIR         Quebec capital gains inclusion rate
QCPPOPT         Quebec CPP/QPP contribution deduction/credit option
[1=deduction,2=credit]
QDGUR           Quebec dividend gross-up rate
QEAMAX          Quebec maximum employment allowance deduction
QEAP            Proportion of earnings for Quebec employment allowance
deduction
QNTCR           Quebec nominal tax credit rate
QUICOPT         Quebec UI contributions deduction/credit option
[1=deduction,2=credit]

INPUT VARIABLES:
hhnin           Number of individuals in household
idalexp         Other allowable employment expenses (229)
idcarry         Carrying charges (221)
iddalimo        Alimony paid (220)
iddues          Union and professional dues (212)
idicapg         Capital gains (actual)
idicqp          CPP/QPP income (114)
ididiv          Dividend income (actual)
idiemp          Wages & salaries
idiint          Interest income (121)
idiloss         Business investment losses (217)
idioinv         Other investment income with net rental
idipens         Pension income (115)
idiroom         Net income from roomers and boarders (126)
idisefm         Self-employed income - farming
idisenf         Self-employed income - non-farming
iditogv         Other government income (taxable)
iditoth         Other non-government income (taxable)
idmovexp        Imputed moving expenses (219)
idothded        Other deductions from total income (232)
idrpp           Registered pension plan contributions (207)
idrrsp          RRSP calculated amount (208)
idtuitn         Tuition fees (320)
imcqppc         CPP/QPP contributions
imioas          OAS benefits
imiotg          Other taxable demogrants
imiuib          Unemployment Insurance\Employment Insurance benefits
imninc          No income flag
imqtfa          Quebec taxable family allowances
imuic           UIC contributions

OUTPUT VARIABLES:
imqalexp        Quebec allowable employment expenses
```

```
imqcapgt        Quebec taxable capital gains
imqcpptc        Quebec CPP/QPP contributions tax credit
imqdedea        Quebec employment allowance
imqdedft        Quebec deductions from total income
imqidivt        Quebec taxable dividends
imqinet         Quebec net income
imqitot         Quebec total income
imquictc        Quebec UI contributions tax credit
```

txqitax Compute taxable income and individual credits (Quebec)

SUMMARY

The process of computing taxable income for Quebec provincial taxes parallels that of the federal method. The following deductions are calculated and subtracted from Net Income (imqinet) to derive a tentative value for Taxable Income (imqitax):

imqpendn:	Pension Income Deduction
imqintdn:	Interest Income Deduction
imqstddn:	Combined Medical Expense Deduction, Charitable Donations and Gifts to Canada or a Province
imqdisex:	Disability Deduction
imqdedfn:	Calculate Deductions from Net Income
imqaxm:	Age Exemption
imqbxm:	Basic Exemption

The computation of Taxable Income is completed by the function txqhstr which calculates exemptions for dependents and performs the transfer of deductions between members of the family.

Unlike the algorithms for the calculation of Federal Taxable Income, this function contains no options for converting these deductions into tax credits.

Pension Income Deduction

Depending upon the filer's age and the type of income, pension and retirement income may be eligible for the Pension Income Deduction. Any portion of this deduction not required to reduce a filer's taxable income to zero may be transferred to the spouse.

SPSM Implementation

The Modeled Pension Income Deduction (imqpendn) is calculated as the lesser of:

a) Eligible Pension Income (idipens), and

a) the Maximum Pension Income Deduction (QYPDL)

The Modeled Pension Income Deduction (imqpendn) is added to Total Deductions from Net Income (imqdedfn) which is subsequently subtracted from Net Income (imqinet).

The function txqhstr may transfer some amount of the Pension Income Deduction to the spouse. In this event, adjustments are made to imqdedfn and imqinet but not to imqpendn.

The model assumes that the value of idipens represents pension income eligible for this deduction. No further checks are made to ensure that the pension is of the appropriate type for the age of the filer.

Interest Income Deduction

Interest income and dividends from Canadian sources are eligible for the Interest Income Deduction. This deduction amounts to the lesser of a fixed amount ($1,000 in 1984) and the eligible income. Any portion of the deduction not required to reduce the filer's taxable income to zero may be transferred to the spouse.

SPSM Implementation

The Interest and Dividend Income Deduction (imqintdn) is calculated as the lesser of:

a) the Maximum Interest and Dividend Income Deduction (QYIDL), and
a) the sum of Interest Income (idiint) and Dividends (imqidivt) minus Carrying Charges (idcarry).

The deduction is added to Total Deductions from Net Income (imqdedfn) which is subsequently subtracted from Net Income (imqinet) to derive Taxable Income (imqitax).

Since the Interest and Dividend Income Deduction is transferable between spouses, the function txqhstr may adjust the values of imqdedfn and imqitax. The value of imqintdn is not adjusted to reflect a transfer to the spouse.

Medical Expense and Charitable Donations Deduction

The filer is allowed a deduction for certain medical expenses, charitable donations and gifts to Canada or a province. In 1984, eligible medical expenses were deductible if they exceeded 3% of Net Income. Deductible charitable donations were limited to 20% of Net Income.

In 1984, if combined medical expenses, charitable donations and gifts to Canada or a Province did not exceed $100, no receipts were required as proof. This was called the Standard Deduction. The Standard Deduction was eliminated in 1986. From then on, all medical expenses and charitable donations required proof.

SPSM Implementation

The database contains variables representing the federal Medical Expense Deduction Allowed (idmeda) and combined Eligible Charitable Donations and Gifts to Canada or a Province (imchara). Net Medical Expenses represent medical expenses in excess of 3% of Net Income. Eligible Charitable Donations represent charitable donations not exceeding

20% of Net Income.

The Combined Medical Expense and Charitable Donations Deduction (imqstddn) is calculated by taking the higher of:

a) the Standard Deduction (QSTD), which may be zero, and
a) the sum of Net Medical Expenses (idmeda), Eligible Charitable Donations and Gifts to Canada or a Province (idchara).

The variable imqstddn is added to Total Deductions from Net Income (imqdedfn) which is subsequently used to reduce Taxable Income.

Disability Deduction

As in the case of the federal income tax system, Quebec allows a special deduction for blind persons or persons confined to a bed or a chair. Any unused portion of the Disability Deduction may be transferred to a spouse or supporting parent.

SPSM Implementation

The database contains a value of the Disability Deduction Allowed on behalf of the filer, spouse or dependents (iddisex) . If this value is non-zero, the Quebec Disability Deduction (imqdisex) takes on the value assigned to the parameter QMAXDX. imqdisex is added in to Total Deductions from Net Income (imqdedfn) which is subsequently subtracted from Net Income.

Since this deduction is potentially transferable, the function txqhstr checks the relative net incomes of the head and spouse and performs any necessary transfers. The values of imqdedfn and imqitax are adjusted to reflect these changes. The value of imqdisex is not updated if the Disability Deduction is transferred to a spouse.

The model does not transfer unused portions of the Disability Deduction from dependant to parent. This probably does not cause a large error since the value on the database already takes into account amounts transferred from the spouse or dependents. The transfer between head and spouse is repeated in txqhstr because the estimate of Net Income is more accurate at this stage than during the database creation process.

Calculate Deductions from Net Income

The variable imqdedfn stores the value of All Deductions from Net Income. It is calculated as the sum of:

imqstddn:	Combined Medical Expense and Charitable Donations Deduction
imqintdn:	Interest and Dividend Income Deduction
imqpendn:	Pension Income Deduction
imqdisex:	Disability Deduction
imuibr:	Unemployment Insurance Benefits Reimbursed
idcloss:	Capital Losses from Other Years

idnclos Non-capital Losses from Other Years

The variable imqdedfn is subtracted from Net Income (imqinet) and may be adjusted in the function txqhstr if deductions are transferred between spouses.

The model does not include the Exemption for Members of a Religious Order, the Exemption for Dependents Aged 21 and Over Suffering from a Physical or Mental Infirmity, Deduction for a Home Relocation Loan, the Sociétés de placements dans l'entreprise québecois Deduction, or the Capital Gains Deduction.

Basic Exemption

Each filer claims a Basic Exemption which is subtracted from Net Income. The Amount of the Basic Exemption for Quebec Provincial Income Taxes is increased occasionally.

SPSM Implementation

For all filers with income, the Quebec Basic Exemption (QBXM) is added to the variable imqexm which accumulates personal exemptions. imexm is subsequently added to imqpex which accumulates all exemptions and is later subtracted from Net Income imqinet.

Age Exemption

All filers who were 65 years of age or older during the taxation year claim the Age Exemption. The value of the Age Exemption is increased occasionally Any unused portion of the Age Exemption may be transferred to the spouse.

SPSM Implementation

The Modeled Quebec Age Exemption (imqaxm) is assigned the value of the parameter QAXM for all filers 65 or over (idage >= 65) if they have income (imninc > 0). This value is added to imqexm (All Personal Exemptions on behalf of filer) which is subsequently added to imqpex (All Personal Exemptions) and subtracted from Net Income imqinet. The function txqhstr may transfer the unused portion of the Age Exemption to the spouse and make corresponding adjustments to the value of imqinet but not to imqaxm.

CROSS REFERENCE

Function	Description
INPUT PARAMETERS:	
QAXM	Quebec age exemption/amount
QBXM	Quebec basic personal exemption/amount
QCAPGFLAG	Capital gains deduction flag
QCHATNF	Quebec charitable donations maximum % net income
QEMPLOFLAG	Database variable(emplo) activation flag

```
QHSC            Quebec Health Services Fund Contribution table
QHSCDIR         Quebec Health Services Fund Contribution Dividend incluion
rate
QHSCFLAG        Quebec Health Services Fund Contribution calculation flag
QHSOASFG        Quebec Health Services Fund Contribution OAS Deduction flag
QMAXDX          Quebec maximum disability deduction/amount
QMEDALL         Quebec medical allowance maximum lower limit
QMEDANF         Quebec medical allowance lower limit net income fraction
QNORTHFLAG      Database variable(north) activation flag
QNTCR           Quebec nominal tax credit rate
QREFOPT         Quebec deduction/credit option [1=deduction,2=credit]
QSTD            Quebec standard deduction from net income
QYIDL           Quebec deduction limit for investment income
QYPDL           Quebec deduction limit for pension income

INPUT VARIABLES:
hhnin           Number of individuals in household
idage           Age
idcapgex        Capital gains exemptions (254)
idcarry         Carrying charges (221)
idcharit        Charitable donations (340)
idcloss         Allowable other years capital loss (253)
iddalimo        Alimony paid (220)
iddisoth        Disability amount for dependants (318)
iddisslf        Disability amount for self (316)
idemplo         Employee home relocation loan dedn (248)
idgifts         Gifts to Canada/provinces/culture (342)
ididiv          Dividend income (actual)
idiemp          Wages & salaries
idiint          Interest income (121)
idiloss         Business investment losses (217)
idipens         Pension income (115)
idmedgro        Medical expenses, gross (330)
idnclos         Allowable other years non-capital loss (252)
idnorth         Northern deductions (255)
idstkded        Stock option deduction (249)
imioas          OAS benefits
imninc          No income flag
imoasr          OAS recovery
imqcapgt        Quebec taxable capital gains
imqidivt        Quebec taxable dividends
imqinet         Quebec net income
imqitot         Quebec total income
imrepay         Social Benefits Repayments
imuibr          UI benefit recovery

OUTPUT VARIABLES:
imqatc          Quebec age tax credit
imqaxm          Quebec age personal exemption
imqbtc          Quebec basic tax credit
imqchara        Quebec allowable charitable donations(calc)
imqdedfn        Quebec all deductions from net income
imqdisex        Quebec disability exemption
imqdistc        Quebec disability tax credit
imqexm          Quebec personal exemptions (Basic+Age)
imqhsfc         Quebec Health Services Fund Contributions
imqhsftc        Quebec Health Services Fund Cont.tax credit
```

```
imqintdn        Quebec interest income deduction allowed
imqitax         Quebec taxable income
imqmeda         Quebec medical expenses allowed
imqpendn        Quebec pension income deduction allowed
imqpex          Quebec personal exemptions and deductions
imqritc         Quebec retirement income tax credit
imqstddn        Quebec stand. /medical+charitable allowed
```

txque Compute provincial taxes for Quebec

SUMMARY

For residents of Quebec, the calculation of provincial taxes roughly approximates the process of calculating federal taxes. The SPSM divides this task among three functions which are described in another section of this document:

1. txqinet calculates total and net income tax
1. txqitax calculates a provisional value for taxable income subject to updating by txqhstr
1. txqhstr performs the calculation of personal exemptions for dependents and the allocation of deductions between head and spouse

The value of Taxable Income (imqitax) calculated by txqhstr is used to look up a value for Basic Provincial Tax (imbpt) in the tax table (QTX).

The Quebec Dividend Tax Credit (imqdtxc) is calculated as a proportion (QDTCR)of Taxable Dividends (imqidivt) and is subtracted from Basic Provincial Tax to derive Provincial Tax Payable (imtxp). Also subtracted is the Quebec Tax Reduction which is a proportion (QTRP) of Provincial Tax Payable (imtxp).

txsask Compute provincial taxes for Saskatchewan

SUMMARY

Saskatchewan Basic Provincial Tax is a proportion (SPTF) of Basic Federal Tax (imbft). A flat surtax, calculated as a proportion (SFTAX) on Net Income (iminet) is added to Basic Tax.

Adjusted Saskatchewan Tax Payable (before a tax reduction is applied, is stored in the temporary variable a) is calculated as Basic Saskatchewan Tax (imbpt) plus a proportion (SSF) of Basic Saskatchewan Tax exceeding the Saskatchewan Surtax Level (SSCI).

Saskatchewan also implements a system of tax reductions for senior citizens and persons with dependent children. The Basic Tax Reduction (STRBR) is augmented by the Senior Citizen's Tax Reduction (STRSC) if the filer is age 65 or older. A tax reduction per child

under 18 (STRPC) up to a maximum total for all children (STRCL) is also added. The number of children claimable for this tax reduction is taken from imnfach, the number of children eligible for Family Allowances.

The total potential tax credit is reduced by a proportion (STRRR) of the tax credit exceeding Adjusted Saskatchewan Tax Payable a to derive Reduced Saskatchewan Tax Payable imtxp.

Starting in 1992, a surtax (SDSF) for the reduction of the deficit is applied to the tax (imptx). In 1995, an amount (SDSRA) was deducted from the surtax.

CROSS REFERENCE

Function	Description
INPUT PARAMETERS:	
SDSF	Saskatchewan provincial deficit surtax fraction
SDSRA	Saskatchewan deficit surtax reduction rate
SFTAX	Saskatchewan provincial flat surtax rate on net income
SPTF	Saskatchewan provincial tax fraction
SRDOPT	Saskatchewan tax reduction calculation option
SSCI	Saskatchewan surtax cut-in
SSF	Saskatchewan provincial high income surtax fraction
SSTR	Saskatchewan spousal & married equivalent tax reduction
STRBA	Saskatchewan tax reduction base amount
STRBR	Saskatchewan basic provincial tax reduction
STRCL	Saskatchewan child tax reduction limit
STRPC	Saskatchewan tax reduction per child
STRRR	Saskatchewan tax reduction reduction rate
STRSC	Saskatchewan tax reduction for senior citizens
INPUT VARIABLES:	
hhnin	Number of individuals in household
idage	Age
idprvftc	Provincial foreign tax credit (Form T2036)
imbft	Basic federal tax
iminet	Net income
immarex	Married exemption claimed
immartxc	Married tax credit claimed
imnfach	Number of family allowance children claimed
imptc	Refundable provincial tax credits
OUTPUT VARIABLES:	
imbpt	Basic provincial tax
imnptc	Non-refundable provincial tax credits
impnit	Provincial net income tax
impsur	Provincial surtax
imptr	Provincial tax reduction
imtxp	Provincial income tax payable

SUMMARY

Unemployment Insurance benefits are calculated by a set of functions which mimic application of UI regulations to individual employment and claim histories. These histories are summaries of administrative data from a 1% sample of persons with some UI claim activity in 1984. Benefits are first calculated on a claim basis. Adjustments are then made to allow for claims overlapping more than one calendar year. Finally, taxable benefits received by individuals within a calendar year are determined.

The Employment Insurance reforms were added to the model. When UIEIOPT=2 then these major reforms are in effect. The changes to fishing benefits have not yet been implemented.

1? Qualifying for benefits is now based on hours of work instead of weeks of work

Since the SPSD does not contain total hours of work, these are derived using the weeks of work prior to claim (ucwwork) multiplied by a new variable: the average weekly hours of work (ucwkhr) which was imputed from the Survey of Labour and Income Dynamics. For more information, see UIREGHRMIN, UIMATHRMIN, UISICHRMIN, and UIEIHWCF.

As for fishing benefits, qualification is based on earnings in the past 31 weeks. These are derived using weeks of work prior to claim (ucwwork) and average weekly earnings (ucern). It is assumed that the weeks ucwwork occurred immediately prior to the start of the claim. See UIFSHERMIN.

2? The Family Income Supplement was added

The Family Income Supplement is given to EI recipients who have low incomes and are raising a family. They are tied to the federal child tax benefits (imfcben). They are reduced when family income is over UIEIFSRL at a rate of UIEIFSRR. See UIEIFSFLG, UIEIFSRL, UIEIFSRR and UIEIMFSP for more details.

3? The Intensity Rule

For persons receiving regular or fishing EI benefits and who did not receive the Family Income Supplement, the intensity rule was applied. The benefit rate (UIEIRATE) depends on the number of weeks of EI collected in the past. See UIEIFIFLG, UIEIRATE, UIEIYRS, ubeiwbp, ucy1, ucy2, ucy3, ucy4, ucy5 for more details.

4? The Minimum Divisor

In order to obtain their maximum benefits, EI claimants must work two weeks more than the minimum entrance requirements. Parameters were added to allow users to model this

change and to add the behavioural response they deem suitable. This change may be modeled using UIEIDIVOPT, UIWK26, UIBXWK, AND UIEIDIV.

5? Minor Changes

There was a minor change in the method used to derive training weeks and training benefits.

The method of using the UI regular benefit weeks adjustment factor UIREGWKFCT was adjusted.

Program Description

Unemployment insurance is an income support program financed jointly by employees, employers and the federal government. It is intended to provide income maintenance during temporary interruptions in employment. As such, it is not a universal program. Among those excluded from coverage are persons who do not participate in the labour force, the self-employed (other than fishermen) and persons who have exhausted benefit entitlements.

Eligibility for UI benefits is in part determined by local conditions. Depending on the unemployment rate in the region where a claimant resides, a claimant may be required to have had between 10 and 14 weeks of insurable employment in the previous 52 weeks before becoming eligible. The 52 week period prior to a claim application is known as the qualifying period. Up to six additional weeks of insurable employment may be required, if a claimant has received UI benefits within the qualifying period (i.e., so-called 'repeater rules').

Once a claim is established and after a waiting period, benefits are normally paid at a weekly rate equal to 60% of the claimant's average weekly insurable earnings. Note that benefit rates may exceed 60% under some special programs or be less than 60% in the event that an individual has some earnings while on UI. Benefits are paid provided that the claimant remains available for work and has not exhausted entitlements (i.e., normally to a maximum of 50 weeks). Initially (i.e., in the Initial Benefit Phase), claimants are entitled to a variable number of weeks depending on claim type and on weeks of insurable employment in the qualifying period. Additional weeks of entitlement are provided for claimants with significant labour force attachment and/or living in high unemployment regions (i.e., the Labour Force Extended and Regional Extended Benefit Phases, respectively).

SPSM Implementation

The SPSM implementation of the UI program has distinct steps representing application of program regulations to a given claim. The function ui operates as a controller which calls the sub-functions which apply UI regulations to each claim and each UI claimant within a household and returns the benefits received by individuals for the calendar year. Claimants may have one or two claims overlapping the survey calendar year. Payments within the calendar year are determined assuming benefits are paid on consecutive weeks.

For SPSM purposes, the unemployment regions are urban size classes within each province. These are not the regions defined for administration of the UI program. The use of proxy unemployment regions is required to ensure data confidentiality.

For purposes of determining entitlements, the claim histories include the initial claim type (i.e., Maternity, Sickness, Retirement, Fishing or Regular) and a type change flag (i.e., indicating that a Sickness claim, for example, was changed to a Regular claim within the Initial Phase). SPSM deems the type change to have taken place immediately after the claim is established and does not attempt to subdivide the Initial Phase into Special and Regular periods. Since type change takes place, the special benefits totals (e.g., Sickness benefits) can not be determined by eliminating the type (e.g., by setting eligibility requirements high) and calculating the reduction in benefits.

The UI algorithm has no behavioral response capacity, so that, for example, no new claims can be created. Similarly, the duration of modeled claims never exceeds observed durations. In the latter case, the assumption is that individuals would not increase durations on claim, if their entitlements were increased. However, no restriction is placed on durations within each phase. Consequently, the elimination of a phase need not reduce the overall duration of a claim.

There are seven sub-functions contained in the ui function. The first called is uiclm which calculates benefits for a single claim. uiclm does this by first calling three sub-functions which test for eligibility requirements based on claim type, repeat claim status, and regional unemployment rates (uielent, uielrep, uielrge). uiclm next calls three sub-functions which determine the weeks of entitlement in the Initial, Labour Force Extended and Regional Extended Phases (uiwkbas, uiwklfe and uiwkrge). If a second claim is required uiclm is called again. Finally ui determines the dollar benefit. Each function and sub-function are briefly described below.

ui

The ui function serves to pass information about each individual with a UI claim in a household to uiclm. If an individual has more than one claim, modeled weeks of benefits in the qualifying period are computed for the first claim and passed to uiclm when the second claim is processed. UI benefits for a calendar year are returned.

uiclm

The sub-function uiclm processes distinct claims from the information passed to it by ui(see list of input variables). In the event of a repeat claim, ui passes information about modeled claim activity in the qualifying period. Modeled changes to UI regulations may produce important differences in first claim activity, thereby effectively changing the status of the second claim.

The uiclm function operates at a claim rather than an individual level. It calls uielent, uielrep and uielrge to establish eligibility. It then changes the type of eligible claims, where appropriate.

Once a claim is established, uiclm calls uiwkbas, uiwklfe and uiwkrge to determine entitlements in each of the Initial, Labour Force Extended and Regional Extended Phases, respectively. The claim is represented by four pointers which identify:

Pointer #1 - 1st week of benefits (following waiting period)
Pointer #2 - 1st week of Labour Force Extended benefits
Pointer #3 - 1st week of Regional Extended benefits
Pointer #4 - week after claim termination.

Weeks are identified by integers with the week of January 1, 1984 being zero. The differences between succeeding pointers will initially equal the entitlement on the appropriate phase. uiclm then calls a utility function uisqz which ensures that interval between #1 and #4 does not exceed the original claim or the maximum allowable duration of a claim. A subsequent call to uisqz produces a second set of (windowed) pointers that do not include any weeks outside the 1984 calendar year.

Benefits are the product of phase weeks times the weekly benefit rate for each phase summed over phases. Claim and calendar year benefits are calculated separately.

uielent

The uielent sub-function applies eligibility tests based on the minimum weeks of insurable employment in the qualifying period required for each initial claim type. These are basic tests which may be superseded by special tests applied to repeaters and other regular claimants. The function sets a flag indicating eligibility status.

uielrep

The uielrep function performs special eligibility tests that apply to repeaters only. The required weeks of insurable employment depend on the regional unemployment rate and on weeks of benefits in the qualifying period. The function performs a two dimensional table lookup to determine whether eligibility is established. The function sets a flag indicating eligibility status.

uielrge

Claims that are initiated as regular claims are subject to variable entrance requirements that depend on the regional unemployment rate. The function uielrge performs the table lookup necessary for these tests. The function sets a flag indicating eligibility status.

uiwkbas

The function uiwkbas determines entitlements in the Initial Phase. For special benefit types (i.e., claims that do not change from maternity, fishing, sickness or retirement), this is the total claim entitlement and is determined by a table lookup. For regular claims, entitlements, up to a maximum number of weeks, are determined in proportion to weeks of insurable employment in the qualifying period up to a maximum number of weeks.

uiwklfe

The function uiwklfe determines entitlements in the Labour Force Extended Phase. As in the Initial Phase, entitlements are determined in proportion to weeks, above a minimum, of insurable employment in the qualifying period.

uiwkrge

The function uiwkrge determines entitlements in the Regional Force Extended Phase. Entitlements are determined by the regional unemployment rate.Interpretation

Discrepancies in the benefits determined by the UI algorithm compared with administrative data result from a combination of factors which could produce both over and underestimation. Among the more important factors contributing to discrepancies are sampling and response error in the SCF data, sampling error in the UI administrative data, errors associated with categorical matching and conversion (i.e., imputing benefits to correct for item non-response) and errors arising from the use of proxy unemployment regions. The following table compares published 1984 UI benefits with values derived from the database and by application of the UI algorithm.

1984 UI Benefit Payments in Millions of Dollars

Province	Published[1]	Reported Re-weighted[2]	Re-weighted & Converted[3]	Simulated 60% Benefit Rate[4]	Effective Benefit Rate[5]
NFLD	499	440	515	509	495
PEI	98	81	88	93	91
NS	418	309	399	402	387
NB	494	378	505	465	452
QIE	3022	2,552	3,349	3,043	2,922
ONT	2,517	1,851	2,687	2,442	2,348
MAN	296	245	301	296	281
SASK	242	192	257	248	236
ALTA	923	754	893	889	853
BC	1,144	1,195	1,599	1,468	1,404
Total	9,952	7,996	10,591	9,856	9,470

[1]Unemployment Insurance Statistics, Cat. 73-202s Gross disbursement in 1984 before correction for retroactive payments, overpayments, cancelled cheques, etc.
[2]Respondents' UI benefits with household weights
[3]Non-response model employed to impute benefits
[4]UI algorithm applied to matched claim data with benefit rate 60% of weekly insurable earnings
[5]UI algorithm with benefit rate equal to average weekly benefits observed in the claim data

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The column labelled Published represents Statistics Canada's figures for UI benefit payments disbursed in 1984. Adjustments to represent payments to 1984 claimants will be less than 1% of the total.

The column labelled SCF Re-weighted represents UI benefits reported by SCF respondents

(employing 'raked weights'). Response errors in the SCF are a major source of error in these estimates. The SCF Re-weighted and Converted column represents the SCF sample augmented with imputed benefits. Imputation has been carried out until the weighted number of beneficiaries agrees (approximately) with administrative data. Model based imputation can only provide an approximate correction for response errors. The columns labelled Modeled 60% Benefit Rate and Modeled Effective Benefit Rate both represent values derived from sampled UI administrative data. The algorithm does not explicitly deal with the Training, Work Sharing or Job Creation components of the UI program. Consequently, the modeled benefits should be lower than actual benefits (i.e., the difference relating to benefit payments on these special programs in excess of that which might have been paid under the regular program). Additionally, use of proxy regional unemployment rates introduces error in testing eligibility and in determining entitlements. These errors will tend to reduce modeled benefits because modeled claim durations may be shorter and can not be longer than observed durations. However, comparison of modeled benefits employing 60% benefit rates to those employing effective benefit rates indicates that the overall percent error of the modeled 60% results (i.e., -0.96% or within the error of the published values) is due in part to compensating errors (i.e., over and underestimation).

CROSS REFERENCE

Function	Description
INPUT PARAMETERS:	
BXM	Basic personal exemption/amount
PYINC	Deflator to calculate previous year income
UIBASFLAG	Basic phase calculation flag (UI and EI)
UIBASOPT	UI reform option [1=normal, 2=Apr'89] (UI and EI)
UIBASRATE	Benefit rate for basic phase (UI only)
UIBXWK	User define behavioral response to minimum divisor [uer][rate] (EI only)
UIDEPOPT	UI dependency option [1=normal, 2=Feb'94] (UI and EI)
UIEFFFLAG	Observed effective weekly benefit rate flag (UI and EI)
UIEIDIV	EI minimum divisor [uer][divisor] (EI only)
UIEIDIVOPT	EI miminum divisor options (EI only)
UIEIFIFLG	EI intensity rule exemption for family supplement receivers (EI only)
UIEIFSFLG	UI EI calculate family supplement flag (EI only)
UIEIFSRL	UI EI family supplement reduction level(EI only)
UIEIFSRR	UI EI family supplement reduction rate (EI only)
UIEIHWCF	EI hours to weeks conversion factor (hours/week) (EI only)
UIEIMFSP	EI Maximum family supplement percent of earnings (EI only)
UIEIOPT	UI Employment Insurance reform option [1=UI, 2=EI Dec'95]
UIEIRATE	Benefit rate under EI reform [Past Wks ben][Rate] (EI only)
UIEIYRS	Number of years of previous EI benefits calculated (EI only)
UIENSRATE	Enhanced rate for basic phase (UI only)
UIENSRTCO	Enhanced rate cutoff (UI only)
UIENTFLAG	Basic entrance requirements flag (UI and EI)

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UIERNMAX        Maximum insurable earnings (UI and EI)
UIEWK           Entitlement (weeks) [wkwrk, uer] (UI and EI)
UIEXTMATWKS     Additional weeks for maternity - behavioural response (UI
and EI)
UIFLAG          UI/EI Activation flag (UI and EI)
UIFSHERMIN      Min. earnings to qualify for fish. benefits [unempl. rate]
(EI only)
UIFSHMINWK      Minimum weeks to qualify for fishing benefits (UI only)
UILFEFLAG       Labour force extended phase calculation flag (UI only)
UILFEMIN        Weeks worked in qualifying period [UILFEWKS index] (UI
only)
UILFERATE       Benefit rate for labor force extended phase (UI only)
UILFEWKS        Weeks LFE entitlement [UILFEMIN] (UI only)
UIMATHRMIN      Minimum hours to qualify for maternity benefits (EI only)
UIMATMINWK      Minimum weeks to qualify for maternity benefits (UI only)
UIMAXBASEWKS    Maximum number of weeks - regular (UI and EI)
UIMAXDUR        Maximum duration of a UI claim (UI and EI)
UIMAXFSHWKS     Maximum number of weeks - fishing (UI and EI)
UIMAXMATWKS     Maximum number of weeks - maternity (UI and EI)
UIMAXRETWKS     Maximum number of weeks - retirement (UI only)
UIMAXSICWKS     Maximum number of weeks - sickness (UI and EI)
UIQPWKS         Additional waiting period for quitters (UI and EI)
UIQUIRATE       Benefit rate for quitters in basic phase (UI and EI)
UIREGHRMIN      Min. hours to qualify for reg. benefits [unempl. rate] (EI
only)
UIREGMINWK      Minimum weeks to qualify for regular benefits (UI only)
UIREGWKFCT      UI regular benefit weeks adjustment factor (UI and EI)
UIREPPREV       Weeks of insurable employment [UIREPWWKD index] (UI only)
UIREPUER        Regional unemployment rate [UIREPWWKD index] (UI only)
UIREPWWKD       Repeater eligibility requirements [UIREPPREV x UIREPUER]
(UI only)
UIRETMINWK      Minimum weeks to qualify for retirement benefits (UI only)
UIRGEFLAG       Regional extended phase calculation flag (UI only)
UIRGEMIN        Unemployment rate for Regional Extended entitlement
[UIRGEWKS index] (UI only)
UIRGERATE       Benefit rate for regional extended phase (UI only)
UIRGEWKS        Weeks Regional Extended entitlement [UIRGEMIN] (UI only)
UIRGNFLAG       Regional requirements flag (UI only)
UIRGNMIN        Regional unemployment rate (UI only)
UIRGNWKS        Weeks required for eligibility (UI only)
UIRPTFLAG       Repeater requirements flag (UI only)
UISICHRMIN      Minimum hours to qualify for sickness benefits (EI only)
UISICMINWK      Minimum weeks to qualify for sickness benefits (UI only)
UITRNBNFCT      UI training benefit per week adjustment factor (EI and EI)
UITRNWKFCT      UI training benefit weeks adjustment factor (UI and EI)
UIWAITWKS       Minimum waiting period all claims (UI and EI)
UIWK26          Conversion rate of weeks worked (52 to 26 weeks)
[prob][rate] (EI only)

INPUT VARIABLES:
cfin            First person in census family [pointer]
cfnpers         Number of persons in census family
hdprov          Province
hdurb           Size of urban area
hhncf           Number of census families in household
hhnin           Number of individuals in household
idage           Age
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idcfrh          Relationship to census family head
idicapg         Capital gains (actual)
ididiv          Dividend income (actual)
idiemp          Wages & salaries
idiint          Interest income (121)
idinoth         Other money income (non-taxable)
idinspo         Person's spouse [pointer]
idioinv         Other investment income with net rental
idipens         Pension income (115)
idiroom         Net income from roomers and boarders (126)
idisefm         Self-employed income - farming
idisenf         Self-employed income - non-farming
iditoth         Other non-government income (taxable)
idninco         No income flag (SPSD variables)
idrand          Random numbers [array]
idspoflg        Person has spouse
imfcben         Total Federal Child Benefits
iminet          Net income
imisa           Social assistance (or replacement program)
imuidpfg        UI claimants has dependents flag
ubcalpd         Benefits paid in calendar year
ubp1            Week # of first payment
ubp4            Week # of last payment
ubp4c           Week # of last payment (windowed)
ubp5            Week # of last training payment
ucbtyp          Claim type
uceff           Effective weekly rate
ucern           Insurable weekly earnings
ucquitp         Penalty for voluntary quit
ucrpeat         Repeat claim flag
ucstart         Week claim established
ucstat          Claim status flag
uctpcng         Type change flag
uctrnbr         Training benefit weekly rate
uctrnwk         Weeks of training benefits
ucuer           Local unemplyment rate (x10)
ucweeks         Weeks of benefits
ucwkhr          Weekly hours of work
ucwwork         Weeks of work prior to claim
ucy1            Weeks on UI in first year before claim
ucy2            Weeks on UI in second year prior to claim
ucy3            Weeks on UI in third year prior to claim
ucy4            Weeks on UI in fourth year prior to claim
ucy5            Weeks on UI in fifth year prior to claim

OUTPUT VARIABLES:
imiuib          Unemployment Insurance\Employment Insurance benefits
imninc          No income flag
imuidpfg        UI claimants has dependents flag
ubcalfs         Family supplement paid in calendar year
ubcalpd         Benefits paid in calendar year
ubcalwk         Weeks on claim in calendar year
ubclmfs         Family supplement paid on claim
ubclmpd         Benefits paid on claim
ubclmwk         Weeks on claim
ubeiwbp         Weeks of past EI benefits
ubern           Modelled insurable weekly earnings
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ubp1            Week # of first payment
ubp1c           Week # of first payment (windowed)
ubp2            Week # of start of second phase
ubp2c           Week # of start of second phase (windowed)
ubp3            Week # of start of third phase
ubp3c           Week # of start of third phase (windowed)
ubp4            Week # of last payment
ubp4c           Week # of last payment (windowed)
ubp5            Week # of last training payment
ubp5c           Week # of last training payment (windowed)
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vardef — Define structure member as an SPSM variable

SUMMARY

The vardef function (actually a macro) is used to define a new variable to the facilities of the SPSM that make use of variables. Please see the *SPSM Programmer's Guide* for more information.